SONY®

VIDEOCASSETTE RECORDER

BVW-70P

BETACAM SP™

MAINTENANCE MANUAL

Volume 1 3rd Edition (Revised 4)
Serial No. 12293 and Higher

⚠警告

このマニュアルは，サービス専用です。
お客様が，このマニュアルに記載された設置や保守，点検，修理などを行うと感電や火災，人身事故につながることがあります。
危険をさけるため，サービストレーニングを受けた技術者のみご使用ください。

⚠WARNING

This manual is intended for qualified service personnel only.
To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

⚠WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.
Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

⚠AVERTISSEMENT

Ce manual est destiné uniquement aux personnes compétentes en charge de l’entretien. Afin de réduire les risques de décharge électrique, d’incendie ou de blessure n’effectuer que les réparations indiquées dans le mode d’emploi à moins d’être qualifié pour en effectuer d’autres. Pour toute réparation faire appel à une personne compétente uniquement.

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Volume 2

15. BLOCK DIAGRAM

16. SCHEMATIC DIAGRAM

17. PRINTED WIRING BOARDS

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19. SPARE PARTS AND FIXTURE

SECTION 1
INSTALLATION

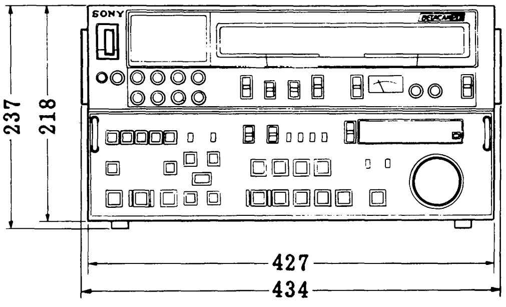
Be sure to install the BVW-70P in locations satisfying the required operational environment described below to assure the BVW-70P's superior performance and to maintain the excellent serviceability and accessibility.

1-1. OPERATIONAL ENVIRONMENT

1. Operating temperature:
   5° C to 40° C
   (Good air circulation is essential to prevent internal heat build-up. Place the unit in locations with sufficient air circulation. Do not block the ventilation holes on the cabinet and the rear panel.)
2. Storage temperature:
   -20° C to +60° C
3. Locations to avoid:
   Areas where the BVW-70P will be exposed to direct sunlight or any other strong lights.
   - Dusty areas or areas where it is subject to vibration.
   - Areas with strong electric or magnetic fields.
   - Areas near heat sources.

1-2. INSTALLATION SPACE

1. The outer dimensions of the unit are shown in the figure below. The rear side must be at least 40 cm from the wall for ventilation and maintenance.
2. When the unit is operated on a desk or similar condition, assure that the clearance above the unit is at least 40 cm to provide accessibility to the printed circuit boards and other mechanical parts. Note that it is not necessary to provide the space when the unit is mounted in a rack since the printed circuit boards can be repaired after it is pulled out.


SONY
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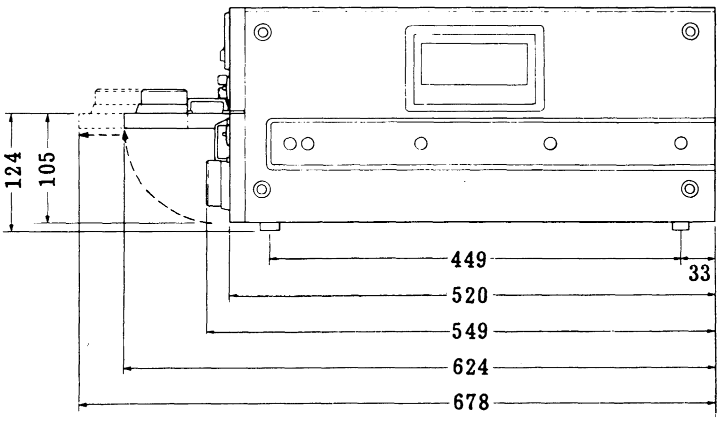
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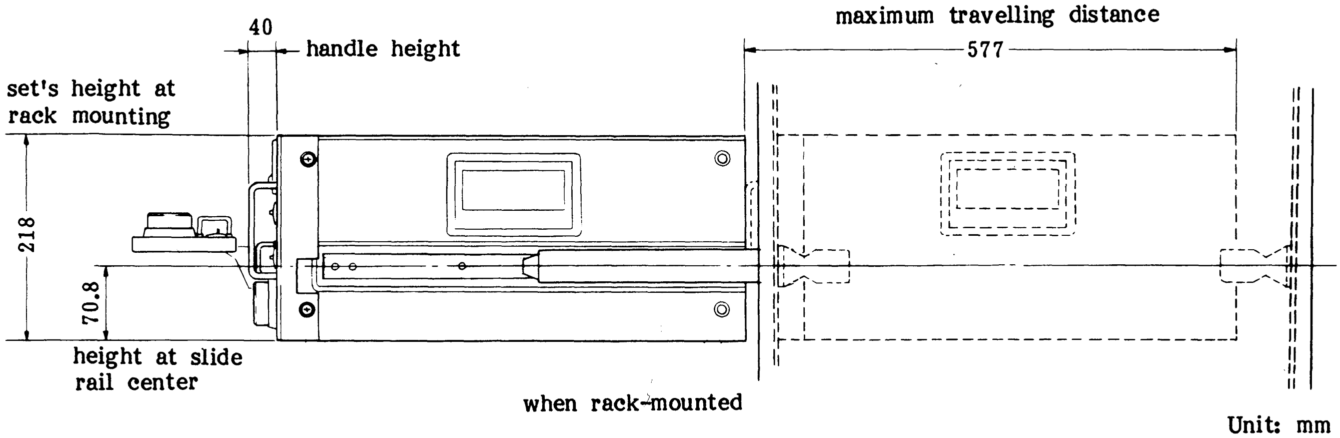

40
handle height
set's height at rack mounting
218
70.8
height at slide rail center
maximum travelling distance
577
when rack-mounted

Unit: mm

1-3. OPERATING VOLTAGE

90 V to 265 V
48 Hz to 64 Hz
Power consumption : 240 W

1-4. CONNECTION CONNECTORS

When external cables are connected to the various connectors on the connector panel during maintenance, the hardware listed below (or equivalents) must be used.

Panel Indication	Connection Connector
VIDEO INPUT REF VIDEO COMPONENT 2 (Y, R-Y, B-Y)	1-560-069-11 PLUG, BNC, MALE
DUB/COMPONENT 1	1-562-159-00 PLUG, 12P, FEMALE
VIDEO OUTPUT 1/2/3 REF VIDEO COMPONENT 2 (Y, R-Y, B-Y)	1-560-069-11 PLUG, BNC, MALE
DUB/COMPONENT 1	1-560-995-00 PLUG, 12P, MALE
AUDIO INPUT CH-1/CH-2/CH-3/CH-4	1-508-084-00 CONNECTOR, XLR, 3P, MALE
AUDIO OUTPUT CH-1/CH-2/CH-3/CH-4 SELECTED : CH-1/CH-3 : CH-2/CH-4	1-508-083-00 CONNECTOR, XLR, 3P, FEMALE
TIME CODE IN	1-508-084-00 CONNECTOR, XLR, 3P, MALE
TIME CODE OUT	1-508-083-00 CONNECTOR, XLR, 3P, FEMALE
MONITOR	1-506-161-00 CONNECTOR, 8P, MALE

Panel Indication	Connection Connector
TBC REMOTE	1-561-610-21 CONNECTOR, 15P, FEMALE and 1-561-929-00 JUNCTION SHELL
REMOTE-1 IN (9P) REMOTE-1 OUT (9P)	1-560-651-00 CONNECTOR, 9P (M) and 1-561-749-00 JUNCTION SHELL, 9P
REMOTE-2 (36P)	1-508-852-00 CONNECTOR 36P, MALE

1-5. INPUT/OUTPUT SIGNALS OF THE CONNECTOR

Component input/output parameters

Input

DUB/COMPONENT 1

Input impedance
: 75 ohms

Input video amplitude
: 100/0/100/0 color bars

Luminance with sync
: 1.0 V p-p

Color difference
: 0.7 V p-p

COMPONENT 2

Input impedance
: 75 ohms

Luminance with sync
: 1.0 V p-p

Color difference
: 0.7 V p-p

Output

DUB/COMPONENT 1

Output impedance
: 75 ohms

Output video amplitude
: 100/0/100/0 color bars

Luminance with sync
: 1.0 V p-p ±2%

Color difference
: 0.7 V p-p ±2%

COMPONENT 2

Output impedance
: 75 ohms

Output video amplitude
: 100/0/100/0 color bars

Luminance with sync
: 1.0 V p-p ±2%

Color difference
: 0.7 V p-p ±2%

Composite input/output parameters

Input

Input impedance
: 75 ohms

Reference video amplitude
: 1V p-p

Composite video amplitude
: 1V p-p

Output

Output impedance
: 75 ohms

Reference video amplitude
: 0.3 V p-p (BS)

Composite video amplitude
: 1V p-p

Audio input/output parameters

Input

Audio line input level
: -10 to +32 dBs (nominal: +4 dBs), 600 ohms/10 kohms, balanced

Microphone input level
: -74 to -32 dBs (nominal: -60 dBs), 600 ohms/3 kohms, balanced

Output

Audio line output level
: - ∞ to +14 dBs (nominal: +4 dBs), 600 ohms, balanced

Monitoring output level
: - ∞ to +14 dBs (nominal: +4 dBs), 600 ohms, balanced

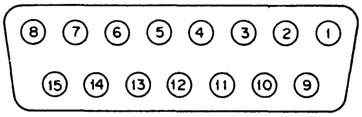
Headphones output level
: - ∞ to -12 dBs, 8 ohms, unbalanced

The input/output level of a component signal conforms to the EBU N-10 standard.

TBC REMOTE

Pin No.	Description	Operating Voltage	IN/OUT
1	SYNC CONTROL	-5 V to +5 V	IN
2	HUE CONTROL	-5 V to +5 V	IN
3	SC CONTROL	-5 V to +5 V	IN
4	VIDEO LEVEL CONTROL	-5 V to +5 V	IN
5	SETUP CONTROL	-5 V to +5 V	IN
6	CHROMA LEVEL CONTROL	-5 V to +5 V	IN
7	-12 V	-12 V	OUT
8	GND	——	IN/OUT
9	FRAME GND	——	IN/OUT
10	NC	——	—
11	NC	——	—
12	NC	——	—
13	Y/C DELAY CONTROL	-5 V to +5 V	IN
14	NC	——	—
15	+12 V	+12 V	OUT

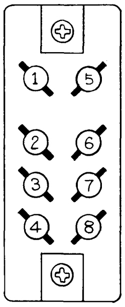
<External view>



TBC REMOTE

MONITOR

Pin No.	Output Signal
1	AUDIO MONITOR OUT (X)
2	VIDEO OUT (X)
3	————
4	————
5	AUDIO MONITOR OUT (G)
6	VIDEO OUT (G)
7	————
8	————

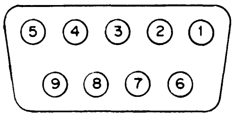


MONITOR

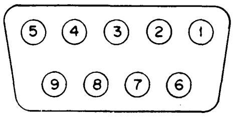
REMOTE-1 IN (9P)/REMOTE-1 OUT (9P)

Pin No.	Controlling Device	Controlled Device
1	Frame Ground	Frame Ground
2	Receive A	Transmit A
3	Transmit B	Receive B
4	Transmit Common	Receive Common
5	Spare	Spare
6	Receive Common	Transmit Common
7	Receive B	Transmit B
8	Transmit A	Receive A
9	Frame Ground	Frame Ground

<External view>

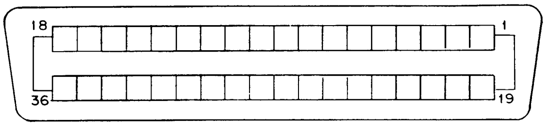


REMOTE-IN (9P)



REMOTE-OUT (9P)

REMOTE-2 (36P)



REMOTE-2 (36P)

Pin No.	Description	Level
1	UNREG 5 V	TTL
2	L-FF COMMAND IN	TTL
3	L-FWD COMMAND IN	TTL
4	L-REW COMMAND IN	TTL
5	L-EJECT COMMAND IN	TTL
6	L-STOP COMMAND IN (*1)	TTL
7	L-PAUSE COMMAND IN (*1)	TTL
8	L-REC COMMAND IN	TTL
9	L-CUT IN COMMAND IN	TTL
10	L-EDT COMMAND IN	TTL
11	L-CUT OUT COMMAND IN	TTL
12	L-FF STATUS OUT	TTL
13	L-FWD STATUS OUT	TTL
14	L-REW STATUS OUT	TTL
15	L-STANDBY STATUS OUT	TTL
16	L-STOP STATUS OUT	TTL
17	L-PAUSE STATUS 1 IN/OUT	TTL
18	L-REC STATUS OUT	TTL
19	L-INSERT STATUS OUT	TTL
20	L-VIDEO INSERT IN	TTL
21	L-AUDIO-1 INSERT IN	TTL
22	L-AUDIO-2 INSERT IN	TTL
23	L-REVERSE COMMAND IN	TTL
24	SPEED A IN	TTL
25	SPEED B IN	TTL
26	L-CTL PULSE OUT (*2)	TTL
27	L-TACH OUT	TTL
28	L-CAPSTAN LOCK OUT	TTL
29	SYNCHRONIZE IN	3.0 V; 0 % -0.3 V; -10 to -15 % +6 V; +10 to +15 %

30	L-STILL TENSION IN (*3)	——
31	H-NORMAL FWD IN	TTL
32	L-PAUSE STATUS 2 OUT	TTL
33	L-SEARCH STATUS IN	TTL
34	NC (*2)	——
35	GND	——
36	GND	——

NOTES:

*1. Holding pins 6 and 7 low simultaneously places unit in the "STANDBY ON/OFF" mode.

*2. When connecting the BVBC-10, set S302 on the SY-61 board to ON.

*3. When connecting the BVR-510A, set System Setup Item 204 to "ENABLE" (refer to Section 1-7).

1-6. SELECT SWITCH AND SHORT PLUG SETTING

1-6-1. Select Switch Setting

Along with the select switches on the control panel and function control panel, there are system select switches on the circuit boards. These switches must be set according to operating condition.

DEC-42P Board

S500: VITC BLANKING Select Switch

(Used for System Setup Item 601.)

SEL: Blanks the incoming Video signal line which corresponds to the the VITC insertion line designated by this set.

ALL: Blanks all V blanking signals.

When the set is shipped, this switch is set to the SEL position.

TBC-7D/7E Board

S101: VISC ON/OFF Switch

When the set is shipped, this switch is set to the ON position.

S200: TEST Switch

When the set is shipped, this switch is set to the ON position.

(Used for electrical alignment at the factory.)

TBC-12P Board

S500: Bit 1 DIGITAL COMB FILTER CHROMA NOISE CANCEL Switch (G-1)

ON: Turns the chroma digital comb filter off.

OFF: Turns the chroma digital comb filter on.

When the set is shipped, this switch is set to the OFF position.

Bit 2 Undefined.

When the set is shipped, this switch is set to the OFF position.

Bit 3 Undefined.

When the set is shipped, this switch is set to the OFF position.

Bit 4 VISC MUTE ON/OFF Switch

ON: Outputs a VISC signal to the VIDEO OUT connector.

OFF: Outputs no VISC signal to the VIDEO OUT connector.

When the set is shipped, this switch is set to the OFF position.

TBC-9P Board

S3: Bits 1 through 8 / S4: Bits 1 and 7

BLANKING POSITION Select Switch (D-1)

During blanking, the arbitrary location of lines 9 through 23 can be selected using S3 and S4.

DIP switch	Line	DIP switch	Line
S3 - Bit 1	9	S4 - Bit 1	17
S3 - Bit 2	10	S4 - Bit 2	18
S3 - Bit 3	11	S4 - Bit 3	19
S3 - Bit 4	12	S4 - Bit 4	20
S3 - Bit 5	13	S4 - Bit 5	21
S3 - Bit 6	14	S4 - Bit 6	22
S3 - Bit 7	15	S4 - Bit 7	23
S3 - Bit 8	16		

Turn on the bit of the switch corresponding to the blanking line.
When the set is shipped, this switch is set to the all ON position.

S4: Bit 8 TBC SYNC DELAY ON/OFF Switch (C-1)
For playback and EE pictures, the video signal is shifted by 16H relative to a sync signal (shifted 16H in the EE mode). The picture is thus shifted on the monitor.
To prevent the picture from being shifted, the sync signal of a playback picture is delayed by 16H relative to a reference input signal.
ON: Delayed by 16H.
OFF: Not delayed (in phase with reference sync signal).
When the set is shipped, this switch is set to the ON position.

EN-48P Board

S1: COLOR/B&W Mode Select Switch (A-3)
(Used for electrical alignment at the factory.)
ON: B&W mode
OFF: COLOR mode
When the set is shipped, this switch is set to the OFF position.

S2: ID BLANKING ON/OFF Switch (A-2)
(Used for electrical alignment at the factory.)
Selects whether a color framing ID pulse should be added to the component signal.
ON: Adds a color framing ID pulse.
OFF: Does not add a color framing ID pulse.
When the set is shipped, this switch is set to the OFF position.

VO-18P Board

S1: Character Background Color Select Switch
W BACK:The background is white with black characters.
B BACK:The background is black with white characters.

S2: Y-MUTE ON/OFF Switch (A-4)
(Used for electrical alignment at the factory.)
ON: Mutes the Y signal of the composite signal output from the VIDEO OUT connector.
OFF: Outputs a normal composite signal from the VIDEO OUT connector.
When the set is shipped, this switch is set to the OFF position.

S3: VIDEO OUTPUT SIGNAL Select Switch (A-3)
This switch selects the type of video signal output from the VIDEO OUTPUT 2 connector on the connector panel.
ON: Outputs a non-composite video signal.
OFF: Outputs a composite video signal.
When the set is shipped, this switch is set to the OFF position.

S4: REGENE 1 Switch
This switch selects whether a VISC signal is output from the DUB/COMPONENT 1 OUT connector.
ON: Output with a VISC signal.
OFF: Output without a VISC signal.
When the set is shipped, this switch is set to the ON position.

S5: REGENE 2 Switch
This switch selects whether a VISC signal is output from the COMPONENT 2 OUT connector.
ON: Output with a VISC signal.
OFF: Output without a VISC signal.
When the set is shipped, this switch is set to the OFF position.

SY-61 Board

S101: CHARACTER ON/OFF Switch (E-12)

ON: A character signal (time code and so on) is superimposed on the video signal which is output from the VIDEO OUT 3 connector and MONITOR connector.

OFF: No character signal is superimposed on the output video signal.

When the set is shipped, this switch is set to the ON position.

S102: REEL POSITION Switch (C-12)

When a cassette tape is inserted, the cassette size is detected and the reel table is automatically moved to the position corresponding to the cassette tape.

This switch is used to move the reel table position without inserting a cassette tape (when the switch is pressed repeatedly, the mode alternates between L and S).

S103: SYSTEM SETUP MENU Switch (B-12)

This switch is used to interface with an external unit and/or set the BVW-70P's initial setup status. When the switch is pressed, a menu is displayed.

S105: SYSTEM SETUP SET Switch (B-12)

Press this switch after the displayed setup data on the menu is set. New data is then set.

S106: SYSTEM SETUP MENU Select Switch (A-11)

ON: Enables setup menu-1/2 operation.

OFF: Enables setup menu-1 operation.

When the set is shipped, this switch is set to the OFF position.

S201: SYNCHRONIZE ON/OFF Switch (D-12)

ON: Two VTRs are synchronized for editing with the BVW-70P as a controller.

OFF: Not synchronized.

When the set is shipped, this switch is set to the ON position.

S202: VTR CONTROL Switch (F-12)

EXT: Set when the BVW-70P is controlled remotely using an optional operation panel (BVR-75A) and extension cable (10-pin).

INT: Set when the BVW-70P's operation panel is used.

When the set is shipped, this switch is set to the INT position.

S203 and S204: Undefined

S206: SYSTEM RESET Switch (G-12)

When this switch is pressed, the VTR is reset to the same state as when power is turned on.

S302: TAPE DIRECTION SIGNAL ON/OFF Switch (H-6)

This switch selects whether a TAPE DIRECTION (L-REV) signal should be output to pin 34 of a REMOTE-2 (36-pin) connector.

ON: Outputs a signal.

OFF: Outputs no signal.

When the set is shipped, this switch is set to the OFF position.

SY-64P Board

S1: VITC/AUTO/LTC Select Switch (H-1)

This switch selects whether the time code or user bit on the counter display indicator should be displayed using an LTC or VITC.

VITC: Displayed using a VITC.

AUTO: Displayed using an LTC when the tape runs at more than 1/2 times normal speed and displayed using a VITC when it runs at less than 1/2 times normal speed.
Displayed using an LTC in the REC/EE mode.

LTC: Displayed using an LTC.

When the set is shipped, this switch is set to the LTC position.

S2: EXT/INT Select Switch (G-1)

EXT: Set when the the external time code generator connected to a time code input terminal is used.

INT: Set when a built-in time code generator is used.

When the set is shipped, this switch is set to the INT position.

S3: REGEN/PRESET Select Switch (F-1)

REGEN: A built-in time code generator is genlocked to the time code signal which is read using a time code reader.

PRESET: Can be preset using an operation panel or remote control pin (9-pin).

When the set is shipped, this switch is set to the PRESET position.

S4: REC RUN/FREE RUN Select Switch (E-1)

REC RUN: A time code generator is activated only in the REC mode.

FREE RUN: A time code generator is activated irrespective of the VTR mode setting.

When the set is shipped, this switch is set to the FREE RUN position.

Note: This switch is valid only when S2 is set to INT, and S3 to PRESET. For settings other than the above, the switch is set to FREE RUN.

S6: VITC ON/OFF Switch (C-1)

ON: The VITC time code generated using a built-in time code generator is recorded.

OFF: The VITC time code contained in an input video signal is recorded directly.

When the set is shipped, this switch is set to the ON position.

S7: ID PRESET Select Switch (B-1)

ON: Turned on when an ID signal is preset to the user bit and data is recorded using the user bit.

OFF: Normal setting

When the set is shipped, this switch is set to the OFF position.

SV-82 Board

S101: Bit 1 TENSION SERVO ON/OFF Switch (B-1)

(Used for electrical alignment at the factory.)

ON: The tension servo feedback is not locked. Servo trouble detection is stopped.

OFF: The tension servo feedback is locked. Servo trouble detection is done.

When the set is shipped, this switch is set to the OFF position.

Bit 2 Forcible INSTANT START ON/OFF Switch

(Used for electrical alignment at the factory.)

ON: The forcible instant start circuit is always activated in the PLAY mode.

OFF: The forcible instant start circuit is activated for 0.5 seconds in the PLAY mode, and the VTR then enters the NORMAL PLAY mode.

When the set is shipped, this switch is set to the OFF position.

Bit 3 Forcible REC Mode Switch

(Used for mechanical alignment.)

This switch is used to play back a tape with the audio signal recorded on the CTL track (CTL height adjustment).

ON: The VTR enters the forcible REC mode to make the tape run at a fixed speed.

OFF: Normal setting

When the set is shipped, this switch is set to the OFF position.

Bit 4 PHI-SQUARE SERVO ON/OFF Switch

ON: The phi-square servo is not activated.

OFF: The phi-square servo is activated.

When the set is shipped, this switch is set to the ON position.

SV-83A Board

S1: H SHIFT MUTE Switch (A-3)

This switch is used to cancel the H lock during adjustment.

ON: The H lock is canceled.

OFF: The H lock is activated.

When the set is shipped, this switch is set to the OFF position.

AU-76P Board

S101, S102, S201, S202 (D-8, D-3, F-8, E-8)

Used for audio adjustment.

S301: Forcible CONFI HEAD Playback Switch (B-1)

ON: Forcibly plays back using a CONFI head in the normal PB mode.

OFF: Plays back using an RP head in the normal PB mode.

(Plays back using a CONFI head in the REC mode.)

When the set is shipped, this switch is set to the OFF position.

DP-73 Board

S1: SCALE VU/dB Select Switch

VU: Displays the audio level in VU.

dB: Displays the peak-to-peak audio level.

When the set is shipped, this switch is set to the VU position.

S2: TEST Switch

(Used for electrical alignment.)

ON: All indicators of the audio level meter light.

OFF: Normal display

When the set is shipped, this switch is set to the OFF position.

DP-73 Board

S1: SCALE VU/dB Select Switch

VU: Displays the audio level in VU.

dB: Displays the peak-to-peak audio level.

When the set is shipped, this switch is set to the VU position.

S2: TEST Switch

(Used for electrical alignment.)

ON: All indicators of the audio level meter light.

OFF: Normal display

When the set is shipped, this switch is set to the OFF position.

Setting the Audio Preset Level

Setting the REC PRESET level

To set the REC PRESET level relative to the factory setting (VU indication at +4dBm input, 0VU; peak indication, -9dB), use variable resistors on the BF-28 board according to the electrical alignment.

The preset level can be set from no signal to +6dB relative to the factory setting level.

(CH-1/RV101, CH-2/RV201, CH-3/RV301, CH-4/RV401)

Setting the PB PRESET level

To set the PB preset level relative to the factory setting (+4dBm), use variable resistors on the BF-28 board according to the electrical alignment.

The preset level can be set from -6dB to +6dB relative to the factory setting level.

(CH-1/RV102, CH-2/RV202, CH-3/RV302, CH-4/RV402)

1-6-2. Short Plug Setting

There are short plugs on the printed circuit boards. These plugs must be set according to operating condition.

DM-56P Board

SP101 and SP102: Y RF AGC ON/OFF

(Used for electrical alignment.)

When the set is shipped, SP101 is set to the OPEN position, and SP102 to the SHORT position.

SP301: Y Signal ON/OFF

(Used for electrical alignment.)

When the set is shipped, SP301 is set to the SHORT position.

SP501 and SP502: C RF AGC ON/OFF

(Used for electrical alignment.)

When the set is shipped, SP501 is set to the OPEN position, and SP502 to the SHORT position.

SP701: C Signal ON/OFF

(Used for electrical alignment.)

When the set is shipped, SP701 is set to the SHORT position.

RP-29P(Y) Board

SP1 and SP2: REC/PB System Adjustment

(Used for electrical alignment.)

When the set is shipped, SP1 and SP2 are set to the SHORT position.

RP-29P(C) Board

SP101 and SP102: REC/PB System Adjustment

(Used for electrical alignment.)

When the set is shipped, SP101 and SP102 are set to the SHORT position.

1-7. SYSTEM CONTROL SETUP

Various select switches are provided on the control panel, subcontrol panel, and printed circuit board in the unit (refer to Section 1-6 "Select Switch and Short Plug Setting").
For the system control items described below, the initial setting at the factory can be set as in Section 1-6 Select Switch and Short Plug Setting.

ITEM LIST FOR INITIAL SETUP MENU

Setup Menu - 1

ITEM-000 SERIES: OPERATIONAL KEY PARAMETER

001: PREROLL TIME
002: CHARACTER H-POSITION
003: CHARACTER V-POSITION
004: CHARACTER V-SIZE
005: DISPLAY INFORMATION SELECT
006: LOCAL FUNCTION ENABLE
007: TAPE TIMER DISPLAY
008: MONITORING SELECTION FOR VTR-TO-VTR EDIT

Setup Menu - 2

ITEM-100 SERIES: OPERATIONAL PARAMETER

101: SELECTION FOR SEARCH DIAL ENABLE
102: MAXIMUM TAPE SPEED
103: AUDIO SELECTED LINE OUT
104: AUDIO MUTING TIME
105: REF VIDEO MISSING ALARM
106: CAPSTAN LOCK
107: REC INHIBIT LAMP FLASHING
108: AUTO EE SELECT
109: FORCED EE WHEN CASSETTE OUT

ITEM-200 SERIES: REMOTE INTERFACE PARAMETER

201: PARA RUN
202: CF FLAG REPLY (625/50 ONLY)
203: STANDBY COMMAND FOR REMOTE-2 I/F
204: STILL TENSION CMD IN REMOTE-2 I/F

ITEM-300 SERIES: EDITING PARAMETER

301: VAR SPEED RANGE FOR SYNCHRONIZATION
302: CAPSTAN RELOCKING DIRECTION
303: EDIT DELAY
304: EDIT FIELD SELECT
305: SYNC GRADE
306: DMC INITIAL SPEED
307: AUTO-DELETION FOR INCONSISTENT DATA

ITEM-400 SERIES: PREROLL PARAMETER

401: FUNCTION MODE AFTER CUE-UP
402: TIME REFERENCE FOR PREROLL
403: AUTOMATIC PREROLL REFERENCE ENTRY

ITEM-500 SERIES: TAPE PROTECTION PARAMETER

501: STILL TIMER
502: TAPE PROTECTION MODE FROM SEARCH
503: TAPE PROTECTION MODE FROM STOP
504: DRUM ROTATION IN STANDBY OFF

ITEM-600 SERIES: TIME CODE GENERATOR PARAMETER

601: VITC POSITION SEL-1
602: VITC POSITION SEL-2
603: ID CODE PRESET
604: TCG REFERENCE
605: TCG REGEN MODE
606: TC OUTPUT SIGNAL IN REGEN MODE
607: U-BIT BINARY GROUP FLAG
608: PHASE CORRECTION
609: TCG CF FLAG
610: REGEN AUTO MODE

ITEM-800 SERIES: MISCELLANEOUS PARAMETER

801: BVE-3000 OPERATION

ITEM-900 SERIES: ADJUSTMENT USE ONLY

901: AUDIO NR IN SP MODE
902: EMERGENCY TAPE PROTECTION
907: CONFI SELECT IN PB MODE

1-7-1. Setup

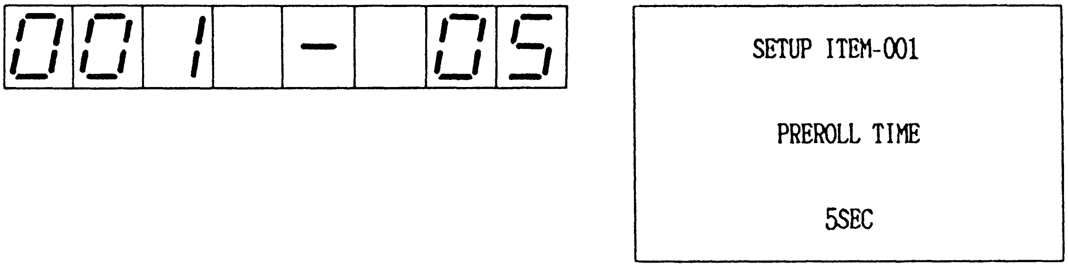
- The system control is set up according to the following procedure.
- The setup appears on the function control panel's time counter display and monitor television. (To display the setup on the monitor, connect the monitor television to the VIDEO OUT-3 connector on the connector panel and turn on the CHARACTER ON/OFF switch on the SY-61 board.)

(1) Turn on the unit POWER switch.

(2) Press the SYSTEM SETUP MENU switch on the SY-61 board; the SETUP ITEM-001 and PREROLL TIME are displayed.

Time counter display on the function control panel

CHARACTER display



SETUP ITEM-001

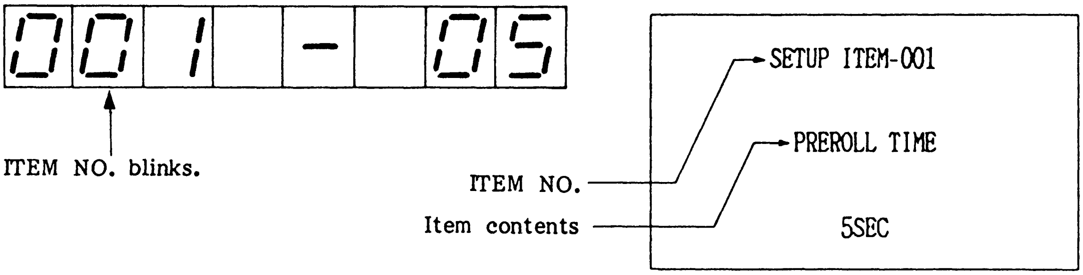
PREROLL TIME

5SEC

(3) After the JOG mode is entered, turn the search dial and select the setup item to be set (the time counter display ITEM NO. blinks). Turn the search dial clockwise to increase the item number and counterclockwise to decrease it.

Time counter display on the function control panel

CHARACTER display



ITEM NO. blinks.

ITEM NO.

Item contents

SETUP ITEM-001

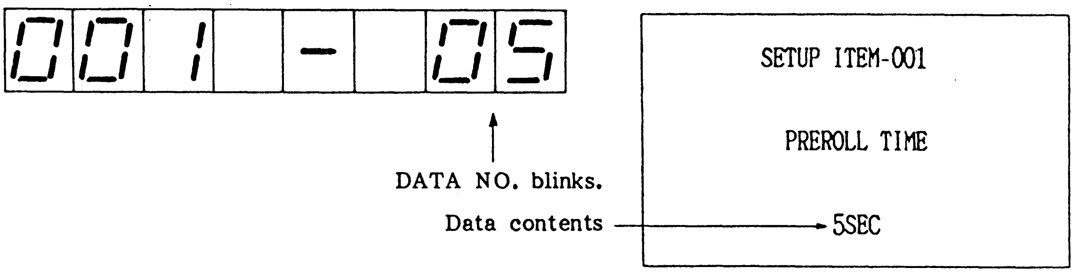
PREROLL TIME

5SEC

(4) Turn the search dial while pressing the search button and set the data (the time counter display DATA NO. blinks). Turn the search dial clockwise to increase the data number and counterclockwise to decrease it.

Time counter display on the function control panel

CHARACTER display



DATA NO. blinks.

Data contents

SETUP ITEM-001

PREROLL TIME

5SEC

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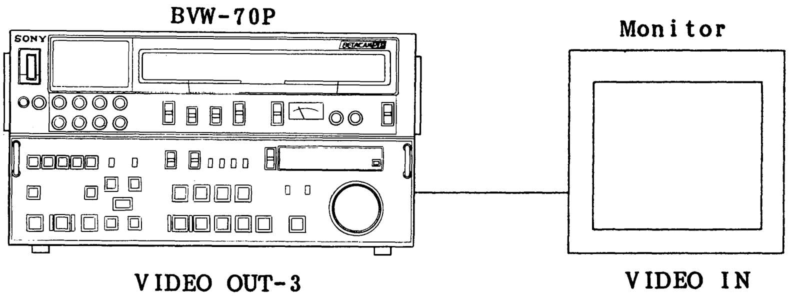
(5) To set other setup items, repeat Steps 3 and 4.

(6) Press the SYSTEM SETUP switch on the SY-61 board after the data has been set. Setup data is then written into a nonvolatile memory (NVRAM). After that, the setting data remains unchanged even if the POWER switch is turned off.

(7) To turn all data to the factory settings, press the time counter display RESET button after pressing the SYSTEM SETUP MENU switch.

Notes: For factory settings only the SETUP MENU-1 can be set as described above. To set the SETUP MENU-2, turn on switch S106 on the SY-61 board and set it in the same manner as described above.

Connection



1-7-2. Setup Item/Data

Setup Item		Setup Data		Item and Data Description
ITEM NO. Time Counter	Item Character Display	DATA NO. Time Counter	DATA Character Display	
ITEM-000 SERIES; OPERATIONAL KEY PARAMETER				
001	PREROLL TIME	00	0 SEC	Preroll time setting. The preroll time can be set from 0 to 15 seconds. When the unit is used for editing, the preroll time setting should be three seconds or more.
		01	1 SEC	
		02	2 SEC	
		03	3 SEC	
		04	4 SEC	
		05	5 SEC	
		06	6 SEC	
		07	7 SEC	
		08	8 SEC	
		09	9 SEC	
		10	10 SEC	
		11	11 SEC	
		12	12 SEC	
		13	13 SEC	
		14	14 SEC	Factory setting: DATA No.05
		15	15 SEC	(5 SEC)
002	CHARACTER H-POSITION	00	00/16	The time data and status monitor output from the VIDEO OUT-3 connector are positioned in the horizontal direction. When the DATA NO. is set to 00, the character is displayed at the left end of the screen. As the DATA NO. is increased, the character is moved by 1/16 steps of the display to the right.
		01	01/16	
		02	02/16	
		03	03/16	
		04	04/16	
		05	05/16	
		06	06/16	
		07	07/16	
		08	08/16	
		09	09/16	
		10	10/16	
		11	11/16	
		12	12/16	
		13	13/16	
		14	14/16	
		15	15/16	Factory setting: DATA NO.04 (04/16)

003	CHARACTER V-POSITION	00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15	00/16 01/16 02/16 03/16 04/16 05/16 06/16 07/16 08/16 09/16 10/16 11/16 12/16 13/16 14/16 15/16	The time data and status monitor output from the VIDEO OUT-3 connector are positioned in the vertical direction. When the DATA NO. is set to 00, the character is displayed at the top of the screen. When it is set to 15, the character is displayed at the bottom of the screen. Factory setting: DATA NO.12 (12/16)
004	CHARACTER V-SIZE	0 1	SMALL LARGE	The vertical size of the time data and status monitor output from the VIDEO OUT-3 connector is set. DATA NO.0: SMALL DATA NO.1: LARGE Factory setting: DATA NO.0 (SMALL)
005	DISPLAY INFORMATION SELECT	0 1 2	TIME DATA & STATUS TIME DATA TIME & STATUS & MODE	When the CHARACTER ON/OFF switch is turned on, the data output from the VIDEO OUT-3 connector is selected. DATA NO.0: Displays the time data and status monitor. DATA NO.1: Displays the time data. DATA NO.2: Displays the time data, status monitor, and VTR mode. Note: The VTR mode indicates whether the VTR is in the SP mode (Metal tape) or STD mode (Oxide tape). Usually, the SP mode is entered during cassette-out operation. When DATA NO.2 is selected, the previous cassette's mode is held. Factory setting: DATA NO.0 (TIME DATA & STATUS)

006	LOCAL FUNCTION ENABLE	0 1 2	ALL DISABLE STOP & EJECT ALL ENABLE	When the VTR is set to the REMOTE mode, the switches/buttons on the function control panel are selected. DATA NO.0: No switches/buttons are activated. DATA NO.1: Only STOP and EJECT buttons are activated. DATA NO.2: All switches/buttons other than RECORDER and PLAYER buttons are activated. Factory setting: DATA NO.0 (ALL DISABLE)
007	TAPE TIMER DISPLAY	0 1	+/-12H 24H	Selects whether the CTL counter is displayed by ±12H or 24H. DATA NO.0: Displayed by ±12H. DATA NO.1: Displayed by 24H Factory setting: DATA NO.0 (+/-12H)
008	MONITORING SELECTION FOR VTR TO VTR EDIT	0 1	RECORDER ONLY AUTO SWITCH	When only one monitor television is connected to the recorder during tape editing with two VTRs, selects whether the player PB video and audio signals should be output to the monitor television by pressing the PLAYER button on the recorder's function control panel, irrespective of its PB.PB/EE switch setting. DATA NO.0: The recorder is not set to the EE mode, and the player's PB signal is selected using the recorder's PB.PB/EE switch. DATA NO.1: The recorder is set to the EE mode, and the player PB video and audio signals are output to the monitor television. Factory setting: DATA NO.0 (RECORDER ONLY)

ITEM-100 SERIES; OPERATIONAL PARAMETER				
101	SELECTION FOR SEARCH DIAL ENABLE	0 1	DIAL DIRECT VIA SEARCH BUTTON	Sets entering the SEARCH mode. DATA NO.0: When the SEARCH dial is turned, the VTR enters the SEARCH mode from any mode other than REC/EDIT. DATA NO.1: When the SEARCH button is pressed, the VTR enters the SEARCH mode. Factory setting: DATA NO.0 (DIAL DIRECT)
102	MAXIMUM TAPE SPEED	0 1 2	X 42 X 42 (SHUTTLE X 24) X 24	Sets the maximum tape speed in the SEARCH mode. DATA NO.0: The maximum tape speed which is in the F.FWD/REW mode and which can be set using a dial in the SHUTTLE mode is 42 times normal speed. DATA NO.1: The maximum tape speed in the F.FWD/REW mode is 42 times normal speed. The maximum tape speed which can be set using a dial in the SHUTTLE mode is 24 times normal speed. DATA NO.2: The maximum tape speed which is in the F.FWD/REW mode and which can be set using a dial in the SHUTTLE mode is 24 times normal speed. Factory setting: DATA NO.1 (X 42 (SHUTTLE X 24))

103	AUDIO SELECTED LINE OUT	0 1 2	MANUAL AUTO AFM/LNG SELECT AUTO LNG SELECT	Selects the signal output to AUDIO SELECTED OUTPUT. DATA NO.0: The selected signal is output using the AUDIO MONITOR SELECT switch. DATA NO.1: An AFM (CH-3/CH-4) signal is output in stereo in the metal particle tape PB mode, and an LNG (CH-1/CH2) signal in the oxide tape PB mode. DATA NO.2: The selected signal is output using the AUDIO MONITOR SELECT switch. However, when the AFM signal is selected in the variable-speed play mode, the LNG signal is output automatically. NOTE: When this item is set to AUTO, the level of the signal output from the SELECTED output connectors cannot be adjusted by any volumes. Factory setting: DATA NO.0 (MANUAL)
104	AUDIO MUTING TIME	00 01 02 03 04 05 06 07 08 09 10	OFF 0.1 SEC 0.2 SEC 0.3 SEC 0.4 SEC 0.5 SEC 0.6 SEC 0.7 SEC 0.8 SEC 0.9 SEC 1.0 SEC	When the VTR enters the PLAY mode from the STOP or STILL mode, sets the muting time of an audio signal. The muting time of the audio signal can be set from 0 (OFF) (not muted) to 1.0 second. Factory setting: DATA NO.00 (OFF)
105	REF VIDEO MISSING ALARM	0 1	OFF ON	When no REF video signal is supplied, selects whether it should be displayed as an alarm. DATA NO.0: No alarm display DATA NO.1: The STOP button lamp flashes as alarm display. Factory setting: DATA NO.0 (OFF)

106	CAPSTAN LOCK	0 1 2 3 4	SWITCH SELECT 2F 2F/4F 4F 8F	Selects the CAPSTAN LOCK mode. DATA NO.0: Selected using capstan lock switch on the sub control panel. DATA NO.1: Capstan lock mode is 2F in spite of switch position. DATA NO.2: Capstan lock mode is 2F /4F in spite of switch position. DATA NO.3: Capstan lock mode is 4F in spite of switch position. DATA NO.4: Capstan lock mode is 8F in spite of switch position. Factory setting: DATA NO.0 (SWITCH SELECT)
107	REC INHIBIT LAMP FLASHING	0 1	OFF ON	Selects whether or not the lamp flashes. Selects whether or not the REC INHIBIT lamp flashes when the REC INHIBIT switch on the subcontrol panel is set to OFF and the record proof tab is broken. DATA NO.0: The lamp does not flash. DATA NO.1: The lamp flashes. Factory setting: DATA NO.0 (OFF)
108	AUTO EE SELECT	0 1	STOP/F.FWD/REW STOP	When the PB.PB/EE switch on the control panel is set to the PB/EE mode, selects the VTR mode which automatically enters the EE mode. DATA NO.0: The video and audio signals in the STOP/EJECT /F.FWD/REW mode enter the EE mode. DATA NO.1: Video and audio signals enter the EE mode in only the STOP/EJECT mode. Factory setting: DATA NO.0 (STOP/F.FWD/REW)
109	FORCED EE WHEN CASSETTE OUT	0 1	ON OFF	Selects whether the PB/EE mode is controlled using a PB.PB/EE switch on the control panel during threading/unthreading and cassette OUT. DATA NO.0: The PB/EE mode cannot be controlled. DATA NO.1: The PB/EE mode can be controlled. Factory setting: DATA NO.0 (ON)

ITEM-200 SERIES; REMOTE INTERFACE PARAMETER				
201	PARA RUN	0 1	DISABLE ENABLE	Selects whether two (or more) VTRs should be operated in parallel operation. DATA NO.0: No parallel operation DATA NO.1: Operation can then be parallel. Note: To operate VTRs in parallel operation, set Item 201 of all VTRs to DATA NO.1. Factory setting: DATA NO.0 (DISABLE)
202	CF FLAG REPLAY (625/50 ONLY)	0 1	8F 4F or 8F	Selects to which mode the COLOR FRAME LOCK STATUS fed to the remote controller is set. DATA NO.0: 8F(Indicates that data is locked at 8 fields.) DATA NO.1: 4F or 8F (Indicates that data is locked at 4 fields or 8 fields.) Factory setting: DATA NO.0 (8F)
203	STANDBY COMMAND FOR REMOTE-2 I/F	0 1	STOP & PAUSE STOP OR PAUSE	Selects the STANDBY ON/OFF mode using the remote control unit which is connected to the REMOTE-2 connector (36-pin). DATA NO.0: When the STOP and PAUSE buttons are pressed simultaneously, the STANDBY mode is turned on or off. DATA NO.1: When the STOP button is pressed, the STANDBY ON mode is entered. When the PAUSE button is pressed in the STOP mode, the STANDBY mode is turned on or off. Factory setting: DATA NO.0 (STOP & PAUSE)
204	STILL TENSION CMD IN REMOTE-2 I/F	0 1	DISABLE ENABLE	When a STILL TENSION command is output from the remote control unit connected to the 36-pin REMOTE-2 connector, selects whether the VTR accepts the command. DATA NO.0: No command is accepted. DATA NO.1: A command is accepted. Note: Select DATA NO.0 when connected to BVE-3000 and DATA NO.1 when connected to BVR-510A. Factory setting: DATA NO.0 (DISABLE)

ITEM-300 SERIES; EDITING PARAMETER				
301	VAR SPEED RANGE FOR SYNCHRONIZATION	0 1	-1 ~ +2 -1.15 ~ +2.3	Sets the speed range when the variable speed is controlled using the remote control unit connected to the REMOTE-1 connector (9-pin). DATA NO.0: -1 to +2 DATA NO.1: -1.15 to +2.3 Factory setting: DATA NO.0 (-1 ~ +2)
302	CAPSTAN RELOCKING DIRECTION	0 1	DECELERATION ACCELERATION	When the CAPSTAN LOCK switch on the subcontrol panel is set to 4F, selects whether the capstan servo is locked in the acceleration or deceleration mode. DATA NO.0: Locked in the deceleration mode. DATA NO.1: Locked in the acceleration mode. Note: Select DATA NO.0 when connected to BVU-800P series, BVW-40P and BVW-10P for editing and DATA No.1 when connected to a 1-inch VTR for editing. Factory setting: DATA NO.1 (ACCELERATION)
303	EDIT DELAY	0 1	6 FIELDS 4 FIELDS	Receives a recording command from the remote control unit during tape editing selects and the number of field delayed until the VTR starts recording. DATA NO.0: Starts recording six fields after the command is received. DATA NO.1: Starts recording four fields after the command is received. Note: Select DATA NO.1 when connected to BVE-500A. Factory setting: DATA NO.0 (6 FIELDS)

304	EDIT FIELD SELECT	0 1 2	1F 2F 1F/2F	Selects the start timing during tape editing. DATA NO.0: Editing starts at field 1 and ends at field 2. DATA NO.1: Editing starts at field 2 and ends at field 1. DATA NO.2: Editing starts and ends at any field. Factory setting: DATA NO.0 (1F)
305	SYNC GRADE	0 1	ACCURATE ROUGH	Selects the editing accuracy when switch S201 (SYNCHRONIZE SW) on the SY-61 board is set to ON and editing is done in the sync mode. DATA NO.0: Editing is done with editing accuracy ± 0 frame. DATA NO.1: Editing is done with editing accuracy ± 1 frame. Factory setting: DATA NO.0 (ACCURATE)
306	DMC INITIAL SPEED	00 01 02 03 04 05 06 07 08 09 10 11 12 13	MANUAL PLAY STILL +0.03 +0.1 +0.2 +0.5 +1 +2 -0.03 -0.1 -0.2 -0.5 -1	Selects the initial speed which is set automatically in selecting DMC (Dynamic Motion Control). DATA NO.00: Sets the initial speed by the rotation angle of the search dial. DATA NO.01: The initial speed is a speed in the PLAY mode. DATA NO.02: The tape stops (STILL MODE). DATA NO.03 to 13: The initial speed is a speed in the search mode. Factory setting: DATA NO.00 (MANUAL)

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307	AUTO-DELETION FOR INCONSISTENT DATA	0 1 2	MANUAL NEG AND EXCESS NEG	Selects the operation when an erroneous edit point is set. DATA NO.0: The DELETE lamp blinks and the ALARM display appears. Delete the undesired edit point or set the edit point correctly. DATA NO.1: When the edit point is set as IN ≧ OUT or AUDIO IN ≧ AUDIO OUT or the number of edit points is excessive, the previously entered edit point is deleted automatically. DATA NO.2: When the edit point is set as IN ≧ OUT or AUDIO IN ≧ AUDIO OUT, the previously entered edit point is deleted automatically. When the number of edit points is excessive, the DELETE lamp blinks and the ALARM display appears. Notes: . When the edit point's key and the DELETE key are pressed simultaneously, data at the edit point is deleted. . When an erroneous edit point is set (the DELETE lamp blinks), editing (PREVIEW or AUTO EDIT) is not executed. Factory setting: DATA NO.0 (MANUAL)

ITEM-400 SERIES; PREROLL PARAMETER				
401	FUNCTION MODE AFTER CUE-UP	0 1	STOP STILL	Selects the mode after CUE-UP is completed. DATA NO.0: Enters the STOP mode. DATA NO.1: Enters the STILL mode. Factory setting: DATA NO.0 (STOP)
402	TIME REFERENCE FOR PREROLL	0 1	CTL TC	When a tape with the time code signal containing a discontinuous point is used and the discontinuous point is prerolled, selects whether the time code signal preceding the point is advanced and prerolled using a CTL signal. DATA NO.0: Advanced using a CTL signal. DATA NO.1: Not advanced using a CTL signal. Factory setting: DATA NO.0 (CTL)
403	AUTOMATIC PREROLL REFERENCE ENTRY	0 1	DISABLE ENABLE	Selects whether the IN point is entered by pressing only the PREROLL button when it is not entered during preroll operation. DATA NO.0: IN point is not entered automatically. DATA NO.1: IN point is entered automatically. Factory setting: DATA NO.0 (DISABLE)

ITEM-500 SERIES; TAPE PROTECTION PARAMETER

501	STILL TIMER	00	0.5 SEC	The unit automatically enters the tape PROTECTION mode after it has been in the tape STOP (or STILL) mode for a fixed time to protect the video head and tape. This item sets the transition time of the tape STOP to tape PROTECTION mode. The time can be set from 0.5 seconds to 30 minutes. Factory setting: DATA NO.14 (8 MIN)
		01	5 SEC	
		02	10 SEC	
		03	20 SEC	
		04	30 SEC	
		05	40 SEC	
		06	50 SEC	
		07	1 MIN	
		08	2 MIN	
		09	3 MIN	
		10	4 MIN	
		11	5 MIN	
		12	6 MIN	
		13	7 MIN	
		14	8 MIN	
		15	30 MIN	
502	TAPE PROTECTION MODE FROM SEARCH	0	STEP FWD	When the time in the STILL mode set using Item 501 passes, the unit enters the tape PROTECTION mode. This item selects the tape PROTECTION mode setting. DATA NO.0: When the time designated by Item 501 passes, the tape is sent repeatedly for 2 seconds at 1/30 times normal speed in the forward direction. DATA NO.1: When the designated time passes, the unit enters the STANDBY OFF mode. DATA NO.2: When the designated time passes, the unit enters the TENSION RELEASE mode. Factory setting: DATA NO.0 (STEP FWD)
		1	STANDBY OFF	
		2	TENSION RELEASE	
503	TAPE PROTECTION MODE FROM STOP	0	STANDBY OFF	When the time in the STOP mode set using Item 501 passes, the unit enters the tape PROTECTION mode. This item selects the tape PROTECTION mode setting. DATA NO.0: When the designated time passes, the unit enters the STANDBY OFF mode. DATA NO.1: When the designated time passes, the unit enters the TENSION RELEASE mode. Factory setting: DATA NO.0 (STANDBY OFF)
		1	TENSION RELEASE	
504	DRUM ROTATION IN STANDBY OFF	0	OFF	Turns the drum motor ON or OFF in the STANDBY OFF mode. DATA NO.0: The drum rotation stops. DATA NO.1: The drum is rotated. Factory setting: DATA NO.0 (OFF)
		1	ON	

ITEM-600 SERIES; TIME CODE GENERATOR PARAMETER				
601	VITC POSITION SEL-1	9 10 11 12 13 14 15 16 17 18 19 20 21 22	9,322 LINE 10,323 LINE 11,324 LINE 12,325 LINE 13,326 LINE 14,327 LINE 15,328 LINE 16,329 LINE 17,330 LINE 18,331 LINE 19,332 LINE 20,333 LINE 21,334 LINE 22,335 LINE	Selects into what line the VITC signal is inserted. The VITC signal can be inserted in lines 9,322 through 22,335. Note: Before the VITC signal is inserted into an input video signal, blank the insertion line. The two modes for blanking can be selected using S500 on the DEC-42P board. SEL: Blanks the incoming video signal line which corresponds to the VITC insertion line designated by this set. ALL: Blanks all V blanking signals. Factory setting: SEL Factory setting: DATA NO.16 (16 LINE)
602	VITC POSITION SEL-2	9 10 11 12 13 14 15 16 17 18 19 20 21 22	9,322 LINE 10,323 LINE 11,324 LINE 12,325 LINE 13,326 LINE 14,327 LINE 15,328 LINE 16,329 LINE 17,330 LINE 18,331 LINE 19,332 LINE 20,333 LINE 21,334 LINE 22,335 LINE	Selects into what line the VITC signal is inserted. The VITC signal can be inserted in lines 9,322 through 22,335. Note: Before the VITC signal is inserted into an input video signal, blank the insertion line. The two modes for blanking can be selected using S500 on the DEC-42P board. SEL: Blanks the input video signal line which corresponds to the VITC insertion line designated by this set. ALL: Blanks all V blanking signals. Factory setting: SEL The VITC signal can be inserted into two positions by Items 601 and 602. Factory setting: DATA NO.18 (18 LINE)

603	ID CODE PRESET	0 1	DISABLE ENABLE	When the ID code is set, selects DATA NO.1 (ENABLE). DATA NO.0: The ID code is not set. DATA NO.1: The ID code set mode is entered. Note: To set the ID code, select the DATA NO.1 (ENABLE) in ITEM 603 and light up the HOLD lamp on the function control panel. By blinking time counter display urge ID code to set. Take a figure up or down places using SHIFT button and select the figure using ADVANCE button. Press the PRESET button after the ID code to set. This item is automatically disabled after setting ID code. Factory setting: DATA NO.0 (DISABLE)
604	TCG REFERENCE	0 1	AUTO EXT	Selects whether the reference signal for a time code generator should be extracted from the input video signal or the reference video signal. DATA NO.0: Signal is changed automatically under the same condition as servo reference. DATA NO.1: Extracted from the reference video signal. Factory setting: DATA NO.0 (AUTO)
605	TCG REGEN MODE	0 1 2	TC & UB TC UB	Selects the signal to be regenerated when the time code generator is in the REGEN mode. DATA NO.0: Both time code and user bit signals are regenerated. DATA NO.1: Only a time code signal is regenerated. DATA NO.2: Only a user bit signal is regenerated. Factory setting: DATA NO.0 (TC & UB)

606	TC OUTPUT SIGNAL IN REGEN MODE	0 1	OFF TAPE REGEN	Selects the signal output from the TIME CODE OUT connector in the internal REGEN mode. DATA NO.0: The playback time code signal is not regenerated and output. DATA NO.1: The playback time code signal is regenerated and output only when the servo is locked in the PLAY mode. Factory setting: DATA NO.0 (OFF TAPE)
607	U-BIT BINARY GROUP FLAG	00 01 10 11	NOT SPECIFIED ISO CHARACTER UNASSIGNED-1 UNASSIGNED-2	Sets the user bit status of the time code signal which is generated using a time code generator. DATA NO.00: Character setting is not specified. DATA NO.01: 8-bit character setting based on IS0646 and IS02022. DATA NO.10: Undefined. DATA NO.11: Undefined. Factory setting: DATA NO.00 (NOT SPECIFIED)
608	PHASE CORRECTION	0 1	OFF ON	Selects whether the phase of the LTC signal which is generated using a time code generator should be corrected and controlled. DATA NO.0: The phase is not corrected and controlled. DATA NO.1: The phase is corrected and controlled. Factory setting: DATA NO.0 (OFF)

609	TCG CF FLAG	0 1 2	OFF ON AUTO	Selects whether the blank bit CF flag of time code data should be turned on or off. DATA NO.0: The CF flag is turned off. DATA NO.1: The CF flag is turned on. DATA NO.2: The CF flag is turned on or off according to the relation between the recorded video signal and the time code's color framing pulse. Note: In the AUTO mode, the CF flag is controlled as described below according to the time code generator mode. INT *PRESET mode: The time code is generated when a CF flag is locked to the video signal. The CF flag is then turned on. INT *REGEN mode: When the capstan lock switch on the subcontrol panel is set to 8F, the CF flag is turned on. For setting other than the above, the CF flag is turned off. Factory setting: DATA NO.0 (OFF)
610	REGEN AUTO MODE	0 1 2	ASSEM & INSERT ASSEM MANUAL	Selects whether a time code is regenerated automatically in the MACHINE TO MACHINE EDIT mode. DATA NO.0: When this set is used as a recorder in the MACHINE TO MACHINE EDIT mode, the TCG regenerates according to the time code on tape during ASSEMBLE and INSERT editing, irrespective of REGEN/PRESET switch setting. DATA No.1: When this set is used as a recorder in the MACHINE TO MACHINE EDIT mode, the TCG regenerates according to the time code on tape during ASSEMBLE editing, irrespective of REGEN/PRESET switch setting. DATA NO.2: The time code generator is activated according to S2 (INT/EXT) and S3 (REGEN/PRESET) on the SY-64P board irrespective of the BVW-70P's mode setting. Factory setting: DATA No. 0 (ASSEM & INSERT)

ITEM-800 SERIES; MISCELLANEOUS PARAMETER

801	BVE-3000 OPERATION	0 1	OFF ON	Item 801 should be set to ON when interfacing with BVE-3000. Factory setting: DATA No.0 (OFF)

ITEM-900 SERIES; ADJUSTMENT USE ONLY

The items below are not displayed on the normal menu to avoid the erroneous operation. To display these items, turn the SEARCH dial while pressing the PLAY button. The three items are used exclusively for adjustment. After adjustment is completed, the switches should be returned to the factory setting position.

901	AUDIO NR IN SP MODE	0 1	ON SWITCH SELECT	This setting is used exclusively for audio adjustment. After adjustment is completed, be sure to return the switch to the factory setting position. The Dolby NR control is selected when a metal tape is used for recording and playback. DATA NO. 0: Turned on at all times when the metal tape is used. DATA NO. 1: Turned on or off using a Dolby NR switch on the subcontrol panel. Note: When an oxide tape is used, set using an Dolby NR switch on the subcontrol panel irrespective of this setting. Factory setting: DATA NO.0 (ON)
902	EMERGENCY TAPE PROTECTION	0 1	ENABLE DISABLE	This setting is used exclusively for servo and mechanism adjustments. After adjustment is completed, be sure to return the switch to the factory setting position. When the VTR detects an error in the tape transport system, selects whether tape protection is done or not. DATA NO. 0: Tape protection is done. DATA NO. 1: Tape protection is not done. Note: When the data No. is 1, "-" (minus) is displayed on the keyboard panel's time counter. Factory setting: DATA NO.0 (ENABLE)

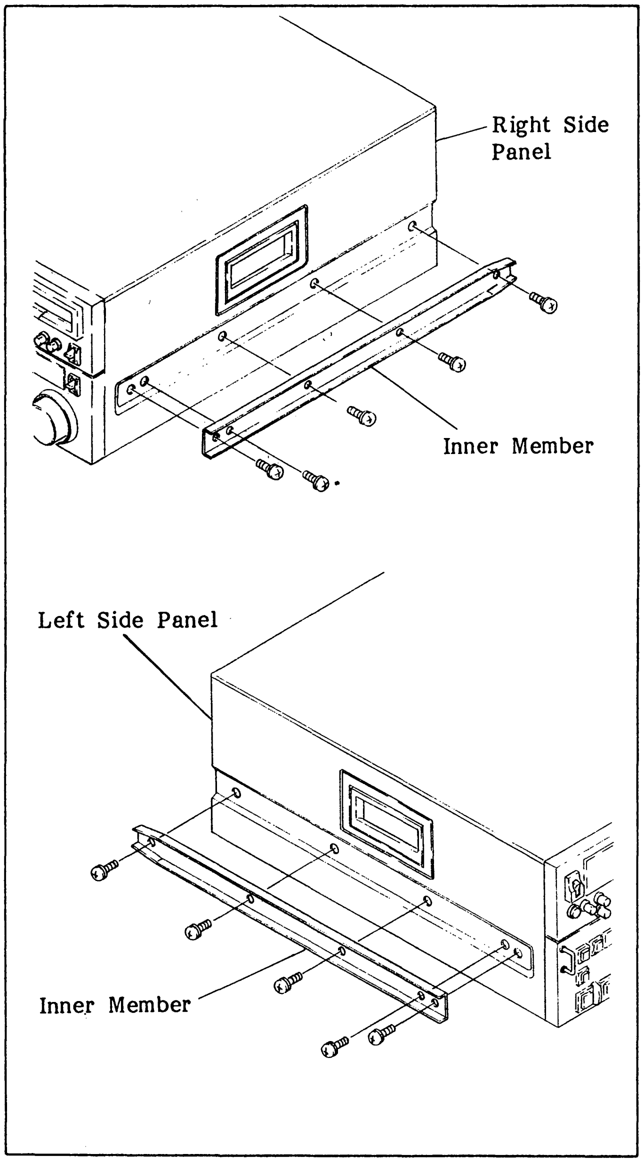
907	CONFI SELECT IN PB MODE	0 1	DISABLE ENABLE	This setting is used exclusively for confi head adjustment of the BVW-70P. After adjustment is completed, be sure to return the switch to the factory setting position. The playback video head is selected in the PB mode. DATA NO. 0: Enters the R/P HEAD PB mode in the PB mode. DATA NO. 1: Enters the CONFI HEAD PB mode when the CONFI switch on the keyboard panel is turned on. Enters the R/P HEAD PB mode when it is turned off. Factory setting: DATA NO.0 (DISABLE)

1-8. RACK MOUNTING

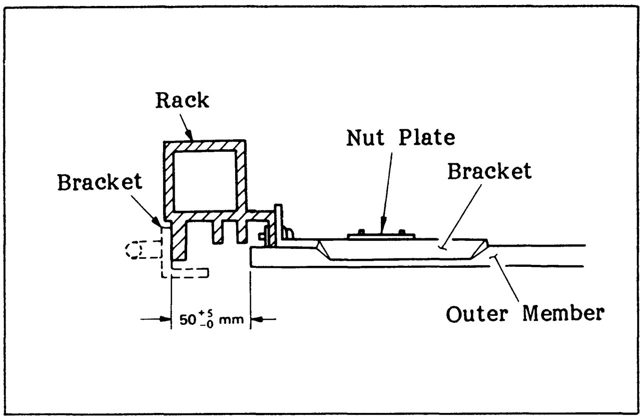
The unit can be mounted in the 19-inch standard rack. It is recommended to use the Rack Mount Kit, RMM-100, optional accessory (including the slide rails, the handle bracket and fixing screws) or the following ACCURIDE's slide rails.

- RACK-MOUNT SLIDES MODEL 305
- SLIDE LENGTH 22 INCH

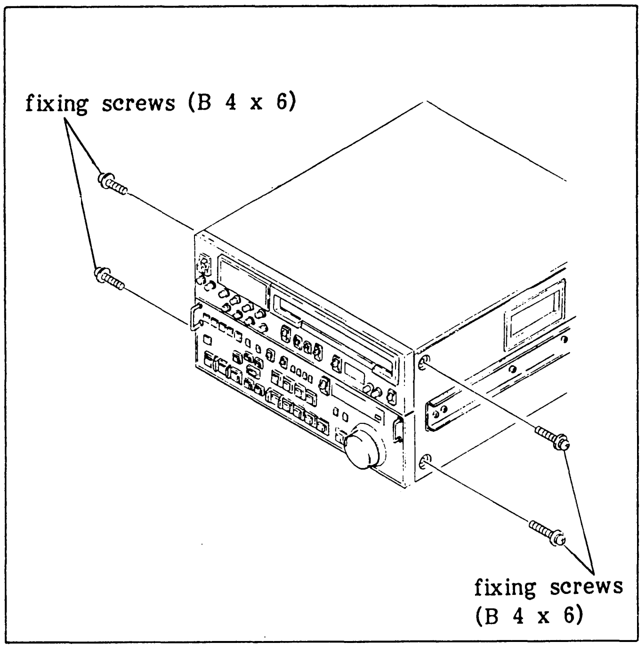
1. Remove the five fixing screws on the Right and Left Side Panels.
2. Install the Inner Members of the slide rails to the Right and Left Side Panels with the screws removed in Step (1).


Right Side Panel
Inner Member
Left Side Panel
Inner Member

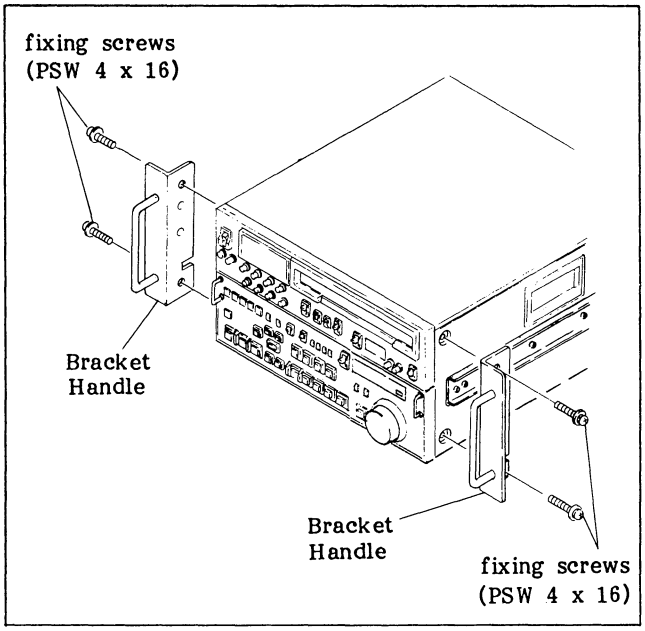
3. Remove the four feet on the Lower Panel.
   - If the unit is mounted in the rack with the feet attached, they will contact the lower and the upper portions of the rack and the unit cannot be pulled out from the rack.
4. Install the Outer Member bracket of the slide rail to the rack. Adjust the distance from the edge of the slide rail to the outside of the rack so that it meets the required specification.


Rack
Nut Plate
Bracket
Bracket
50^{+5}_{-0} mm
Outer Member

5. Remove the two fixing screws on the Right and Left Side Panels. (Be careful not to lose these four screws.)


fixing screws (B 4 x 6)
fixing screws (B 4 x 6)

6. Install the Handle Brackets with the supplied screws (PSW 4 x 16) for these brackets.



(NOTE) Never use screws (PSW 4 x 16) to install the Right and Left Side Panels. Be sure to install the Right and Left Side Panels with the screws (B 4 x 6) removed in Step (5). If using the screws (PSW 4 x 16) by mistake, may cause trouble in the unit.

NOTE:(1) When several units are mounted in a rack, it is recommended to install a fan for ventilation. Good air circulation is essential to prevent internal heat build-up in a rack (5 ° C to 40 ° C must be met for all units).

(2) Never remove the Upper Panel and Lower Panels during rack mounting.

(3) Be sure to secure the rack to the floor to avoid accidents when the unit is pulled out.

1-9. SUPPLIED ACCESSORIES

Supplied accessories are as follows:

1. AC Power Code
2. 9-pin Remote Control Cable; RCC-5G
3. 12-pin Dubbing Cable
4. Extension Board; EX-116
   EX-134
   EX-151
5. Screws for Rack Mounting; PSW 4 x 16 (four)

1-10. OPTIONAL ACCESSORIES

The followings are provided as the optional accessories. Suitable accessories should be used for each system.

1. Rack Mount Kit (RMM-100)
   The rack mount kit is used to mount the unit with the rack mount kit, RMM-100, in a standard 19-inch rack.
2. Cleaning Cassette Tape (BCT-5CLN)
3. Remote Control Unit (BVR-75A)

SECTION 2
TECHNICAL INFORMATION

2-1. SPECIFICATIONS

GENERAL

Power requirements : AC 90 to 265 V, 48 to 64 Hz
Power consumption : 240 W
Operating temperature : +5°C to +40°C
Storage temperature : -20°C to +60°C
Humidity : Less than 80 %
Weight : 30 Kg
Dimensions : 427 x 237 x 520 mm (w/h/d)
Tape speed : 101.51 mm/s
Record and playback time : 100 minutes maximum (with a BCT-90ML cassette)
Fast forward/rewind time : Less than 180 seconds (with a BCT-90ML cassette)
Search speed
    Shuttle mode : Still, 1/30, 1/10, 1/5, 1/2, 1, 2, 5, and 24 times normal in forward and reverse directions.
    Variable mode : Still, 1/30. 1/10, 1/5, 1/2, and 1 times normal in forward and reverse directions.
        2 times normal in forward direction.
    Jog mode : Still to 1 in forward and reverse directions.
Video cassette : 1/2-inch, Betacam, and Betacam SP cassette for Beta format.
    Metal particle tape : BCT-5M/10M/20M/30M/
        BCT-5ML/10ML/20ML/30ML/60ML/90ML or equivalent
    Oxide tape : BCT-5G/10G/20G/30G/
        BCT-5GL/10GL/20GL/30GL/60GL/90GL or equivalent

Component video characteristics (component input to component output, metal tape)
Bandwidth (relative to REF DC LEVEL)
  Luminance : 25 Hz to 5.5 MHz $^{+0.5}_{-3.0}$ dB
  Color difference : 25 Hz to 2.0 MHz $^{+0.5}_{-3.0}$ dB
Signal-to-noise ratio
  Luminance unweighted : More than 48 dB (SC trap: OFF, 10 kHz to 5 MHz)
  Color difference unweighted : More than 48 dB (SC trap: OFF, 10 kHz to 5 MHz)
Y/C delay : Less than 20 nsec
Low frequency non-linearity
  Luminance Y : Less than 3%
  Color difference : Less than 4%
Pulse distortion (luminance, 2T pulse)
  K-pulse : Less than 1.5%
  K-pb : Less than 1.0%
  K-bar : Less than 1.0%
Pulse distortion (color difference, 8T pulse)
  K-pulse : Less than 1.5%
  K-pb : Less than 1.0%
  K-bar : Less than 1.0%

Component video characteristics (component input to component output, oxide tape)
Bandwidth (relative to REF DC LEVEL)
  Luminance : 25 Hz to 4.0 MHz $^{+0.5}_{-6.0}$ dB
  Color difference : 25 Hz to 1.5 MHz $^{+0.5}_{-3.0}$ dB
Signal-to-noise ratio
  Luminance unweighted : More than 46 dB (SC trap: OFF, 10 kHz to 5 MHz)
  Color difference unweighted : More than 45 dB (SC trap: OFF, 10 kHz to 5 MHz)
Y/C delay : Less than 20 nsec
Low frequency non-linearity
  Luminance Y : Less than 3%
  Color difference : Less than 4%
Pulse distortion (luminance, 2T pulse)
  K-pulse : Less than 3.0%
Pulse distortion (color difference, 8T pulse)
  K-pulse : Less than 3.0%

The input/output level of a component signal conforms to the EBU N-10 standard.

Composite video characteristics (composite input to composite output, metal tape)

- Bandwidth : 25 Hz to 4.8 MHz $^{+1.0}_{-1.5}$ dB
- Signal-to-noise ratio
  - Luminance unweighted : More than 45 dB (SC trap: ON, 10 kHz to 5 MHz)
  - Chrominance AM : More than 48 dB (SC trap: ON, 100 Hz to 1 MHz)
  - PM : More than 48 dB (SC trap: ON, 100 Hz to 1 MHz)
- Y/C delay : Less than 20 nsec
- Low frequency non-linearity : Less than 3%
- Pulse distortion (2T pulse)
  - K-pulse : Less than 2%
  - K-pb : Less than 2%
  - K-bar : Less than 2%
- Differential gain : Less than 3%
- Differential phase : Less than 3%

Composite video characteristics (composite input to composite output, oxide tape)

- Signal-to-noise ratio
  - Luminance unweighted : More than 44 dB (SC trap: ON, 10 kHz to 5 MHz)
  - Chrominance AM : More than 48 dB (SC trap: ON, 100 Hz to 500 kHz)
  - PM : More than 48 dB (SC trap: ON, 100 Hz to 500 kHz)
- Y/C delay : Less than 20 nsec
- Low frequency non-linearity : Less than 3%
- Pulse distortion (2T pulse)
  - K-pulse : Less than 4%
  - K-pb : Less than 5%
  - K-bar : Less than 2%
- Differential gain : Less than 3%
- Differential phase : Less than 3%

Component input/output parameters

Input

DUB/COMPONENT 1
  Input impedance : 75 ohms
  Input video amplitude : 100/0/100/0 color bars
    Luminance with sync : 1.0 V p-p
    Color difference : 0.7 V p-p

COMPONENT 2
  Input impedance : 75 ohms
  Input video amplitude : 100/0/100/0 color bars
    Luminance with sync : 1.0 V p-p
    Color difference : 0.7 V p-p

Output

DUB/COMPONENT 1
  Output impedance : 75 ohms
  Output video amplitude : 100/0/100/0 color bars
    Luminance with sync : 1.0 V p-p ±2%
    Color difference : 0.7 V p-p ±2%

COMPONENT 2
  Output impedance : 75 ohms
  Output video amplitude : 100/0/100/0 color bars
    Luminance with sync : 1.0 V p-p ±2%
    Color difference : 0.7 V p-p ±2%

Composite input/output parameters

Input

  Input impedance : 75 ohms ±1%
  Reference video amplitude : 1.0 V p-p
  Composite video amplitude : 1.0 V p-p

Output

  Output impedance : 75 ohms ±1%
  Reference video amplitude : 0.3 V p-p (BS)
  Composite video amplitude : 1.0 V p-p ±2%

Longitudinal audio characteristics (metal tape)

Frequency response
  20 dB below peak level (peak level = +8 dB above *operational level) : 50 Hz to 15.0 kHz $^{+1.0}_{-2.0}$ dB

Signal-to-noise ratio
  Referred to peak level (peak level = +8 dB above *operational level) : More than 68 dB (weighted CCIR 468-3)

Distortion K3 at peak level (peak level = +8 dB above *operational level) : Less than 3% (at 1 kHz)

Wow and flutter (DIN 45507) : Less than 0.1%

Crosstalk : More than 71 dB (at 1 kHz)

Stereo phase : ±20° (at 15 kHz)

Erase ratio : More than 65 dB (at 1 kHz)

FM audio characteristics (metal tape only)

Frequency response

20 dB below peak level (peak level = +19 dB above *operational level) : 20 Hz to 20.0 kHz $^{+0.5}_{-2.0}$ dB

Signal-to-noise ratio

Referred to peak level (peak level = +19 dB above *operational level) : More than 72 dB (weighted CCIR 468-3)

Distortion K3 at *operational level (0 VU) : Less than 0.5% (at 1 kHz)

Crosstalk : More than 70 dB (100 Hz to 12.5 kHz)

Stereo phase : ±10° (at 20 kHz)

Longitudinal audio characteristics (oxide tape): without A.N.R

Frequency response

20 dB below peak level (peak level = +8 dB above *operational level) : 50 Hz to 15.0 kHz ±3 dB

Signal-to-noise ratio

Referred to peak level (peak level = +8 dB above *operational level) : More than 62 dB (weighted CCIR 468-3)(with A.N.R.)

Distortion K3 at peak level (peak level = +8 dB above *operational level) : Less than 3% (at 1 kHz)

Wow and flutter (DIN 45507) : Less than 0.1%

Crosstalk : More than 60dB (at 1 kHz)

Stereo phase : ±45° (at 15 kHz)

Erase ratio : More than 65 dB (at 1 kHz)

*Operational level = +4 dBm

Input/output parameters

Input

Audio line input level : -10 to +32 dBs (nominal: +4 dBs), 600 ohms/10 kohms, balanced

Microphone input level : -74 to -32 dBs (nominal: -60 dBs), 600 ohms/3 kohms, balanced

Output

Audio line output level : - ∞ to +14 dBs (nominal: +4 dBs), 600 ohms, balanced

Monitoring output level : - ∞ to +14 dBs (nominal: +4 dBs), 600 ohms, balanced

Headphones output level : - ∞ to -12 dBs, 8 ohms, unbalanced

Processor adjustment range

Video level : ±3 dB

Chroma level : ±3 dB

Black level : ±100 mV

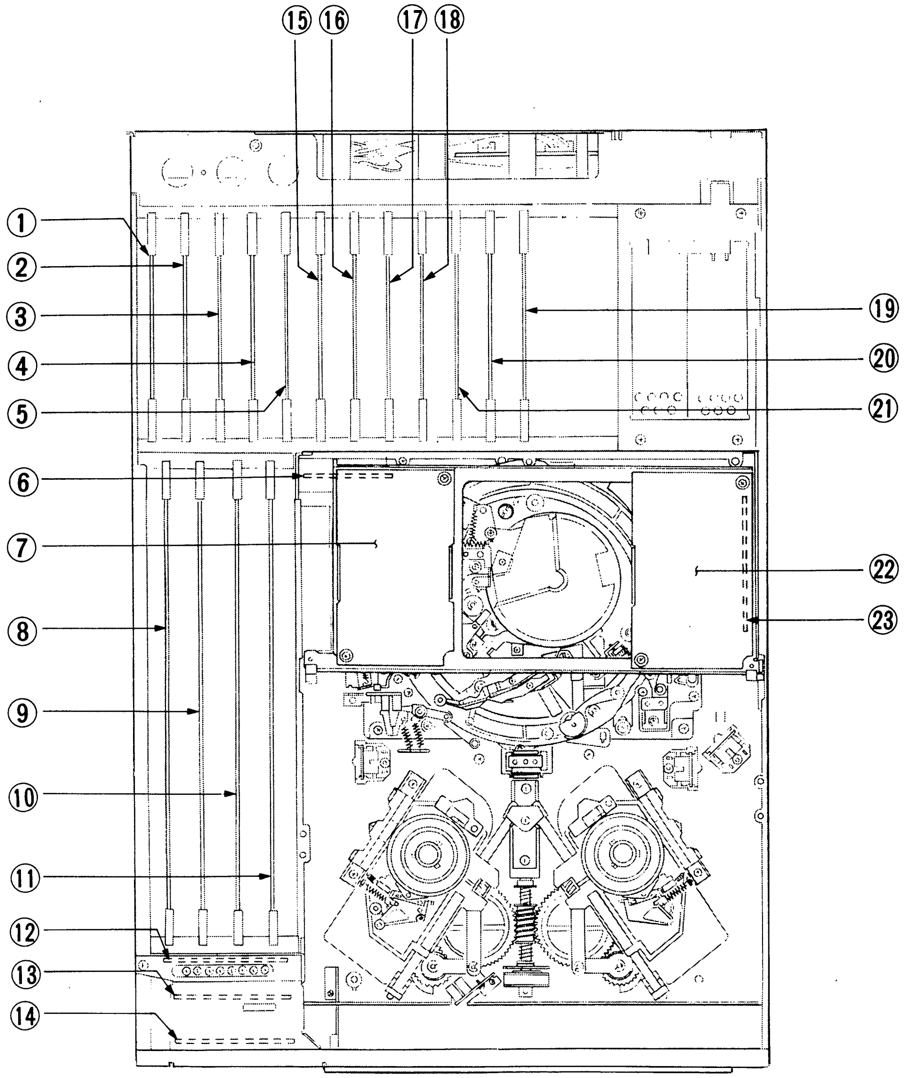
System SC phase : 360° p-p

System sync phase : $^{+3}_{-1}$ µs (fine adjustment range : 300 ns)

Y/C delay : ±50 ns

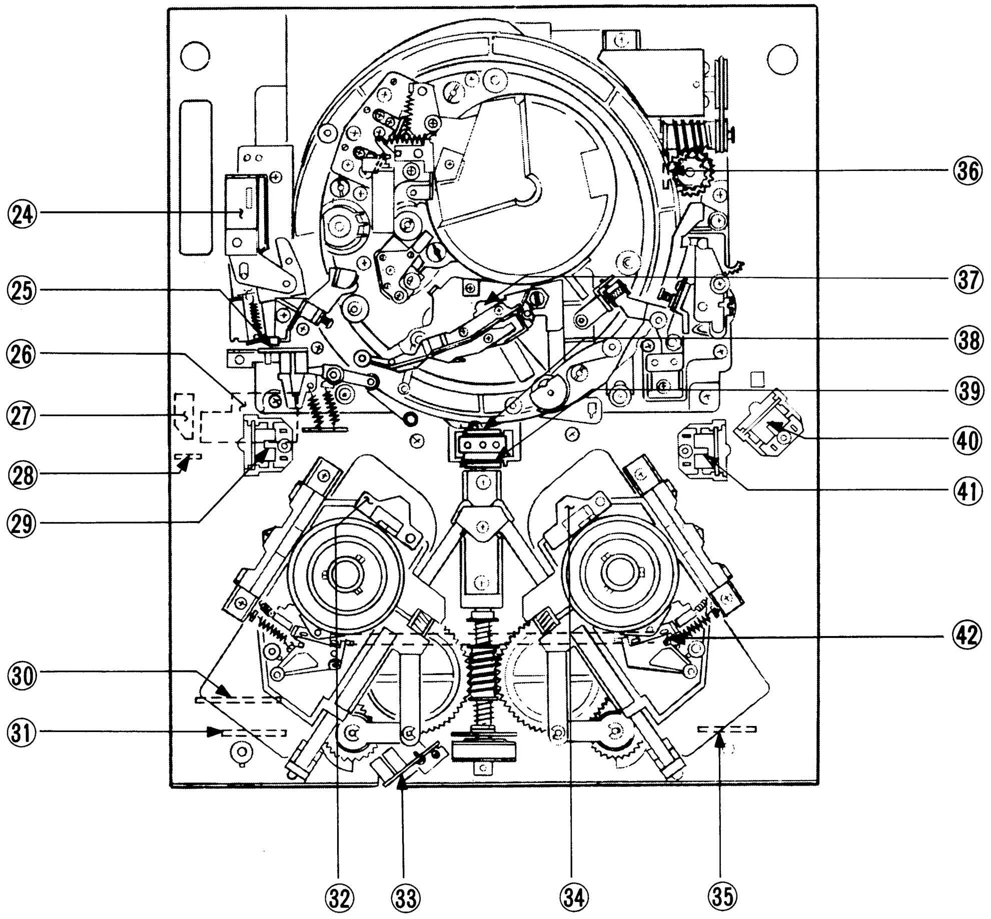
2-2. LOCATION OF THE PRINTED CIRCUIT BOARDS

TOP VIEW



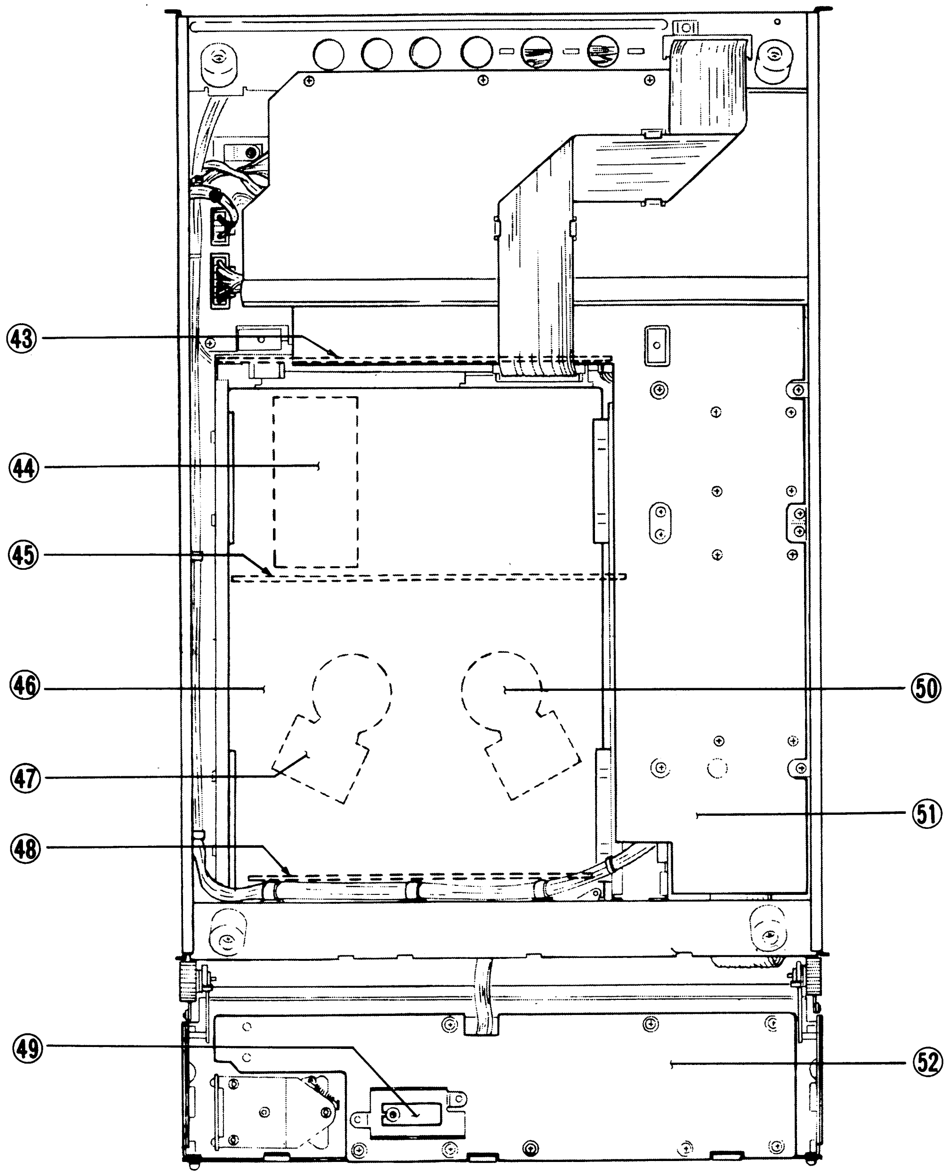
①	TBC-9P Board
②	EN-48P Board
③	VO-18P Board
④	MD-46P Board
⑤	DEC-46P Board
⑥	RE-34 Board
⑦	RP-29P (C) Board
⑧	TBC-12P Board
⑨	TBC-7D/7E Board
⑩	DM-56P Board
⑪	DEC-42P Board
⑫	BF-28 Board
⑬	DP-73 Board
⑭	DP-74 Board
⑮	AFM-1 Board
⑯	AU-75P Board
⑰	AU-76P Board
⑱	TC-40P Board
⑲	SV-84P Board
⑳	SV-83A Board
㉑	SV-82 Board
㉒	RP-29P (Y) Board
㉓	SE-57 Board

TOP VIEW



㉔	PD-35 Board
㉕	PTC-15 Board
㉖	CL-14 Board (Cassette-up Compartment)
㉗	PC-33 Board (Cassette-up Compartment)
㉘	PC-33 Board (Cassette-up Compartment)
㉙	PTC-23 Board
㉚	PC-47 Board (Cassette-up Compartment)
㉛	PC-41 Board (Cassette-up Compartment)
㉜	DE-15 Board
㉝	PTC-21 Board
㉞	DE-15 Board
㉟	PC-41 Board (Cassette-up Compartment)
㊱	PTC-31 Board
㊲	TR-18 Board
㊳	PTC-20 Board
㊴	PTC-36 Board
㊵	PTC-23 Board
㊶	PTC-23 Board
㊷	CL-24 Board (Cassette-up Compartment) (Serial No. 12412 and higher)

BOTTOM VIEW


㊸
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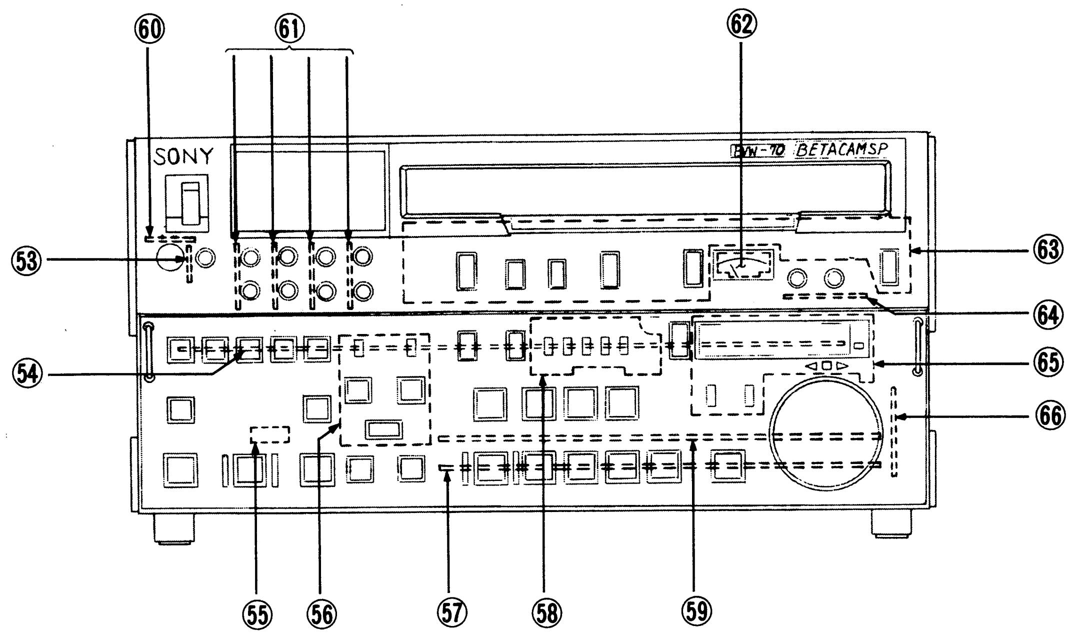
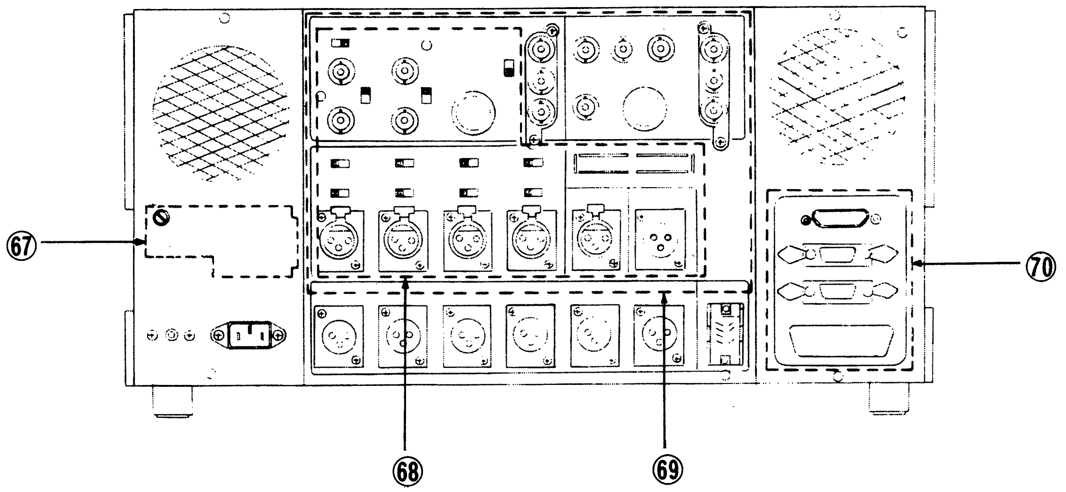
㊽
㊾
㊿
(51)
(52)

㊸ MB-192 Board
㊹ RE-28 Board
㊺ DR-56 Board
㊻ SY-61 Board
㊼ RM-40 Board
㊽ RE-36 Board
㊾ PT-9 Board
㊿ RM-40 Board
(51) MB-191A Board
(52) KY-96A Board

FRONT VIEW


(60)
(61)
(62)
SONY
BVW-70 BETACAMSP
(53)
(54)
(63)
(64)
(65)
(66)
(55)
(56)
(57)
(58)
(59)

REAR VIEW



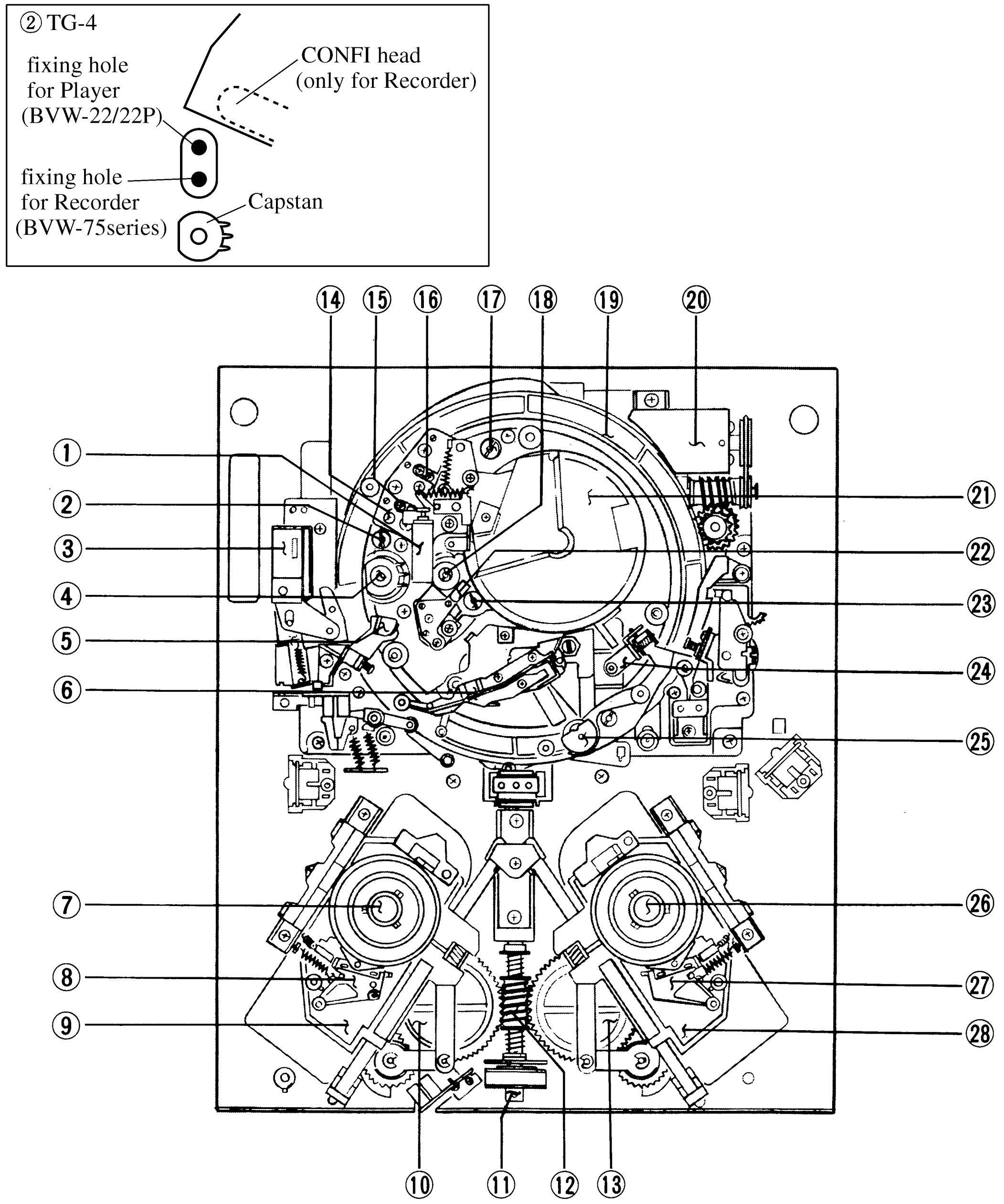
(53) HP-33 Board
(54) CP-103P Board
(55) HC-11 Board
(56) KY-107 Board
(57) SY-61 Board
(58) KY-108 Board
(59) SY-64P Board

(60) VR-62 Board
(61) VR-42 Board
(62) DP-72 Board
(63) SW-144 Board
(64) VR-61 Board
(65) DP-71 Board
(66) PTC-32 Board

(67) AC-96 Board
(68) CP-101P Board
(69) CP-111/CP-161A Board
(70) RM-57 Board

2-3. LOCATION OF THE MAIN MECHANICAL PARTS/COMPONENTS

TOP VIEW


② TG-4
fixing hole for Player (BVW-22/22P)
CONFI head (only for Recorder)
fixing hole for Recorder (BVW-75series)
Capstan
⑭
⑮
⑯
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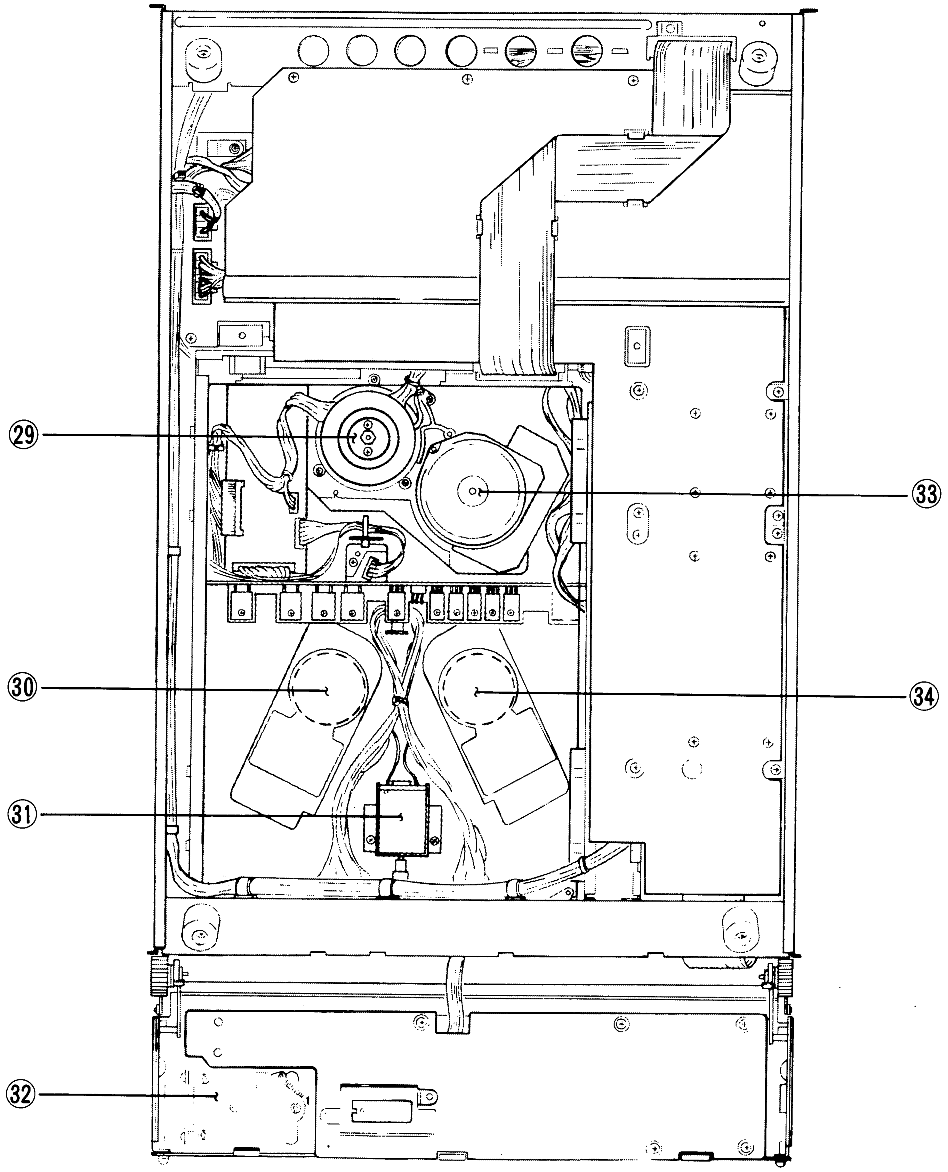
① Cleaning Roller Block
② TG-4
③ Pinch Solenoid
④ Capstan Shaft
⑤ Full Erase Head
⑥ S Tension Regulator
⑦ Supply Reel Table
⑧ Supply Brake Ass'y
⑨ Supply Motor Plate
⑩ Supply Worm Wheel
⑪ Timing Pulley
⑫ Worm Gear
⑬ Take-up Worm Wheel
⑭ AT Head Block
⑮ Audio Confidence Head
⑯ Audio/TC Head
⑰ TG-3
⑱ TG-1
⑲ Threading Ring
⑳ Gear Box
㉑ Head Drum
㉒ CTL Head
㉓ TG-2
㉔ T Drawer Arm
㉕ Pinch Roller
㉖ Take-up Reel Table
㉗ Take-up Brake Ass'y
㉘ Take-up Motor Plate

BOTTOM VIEW

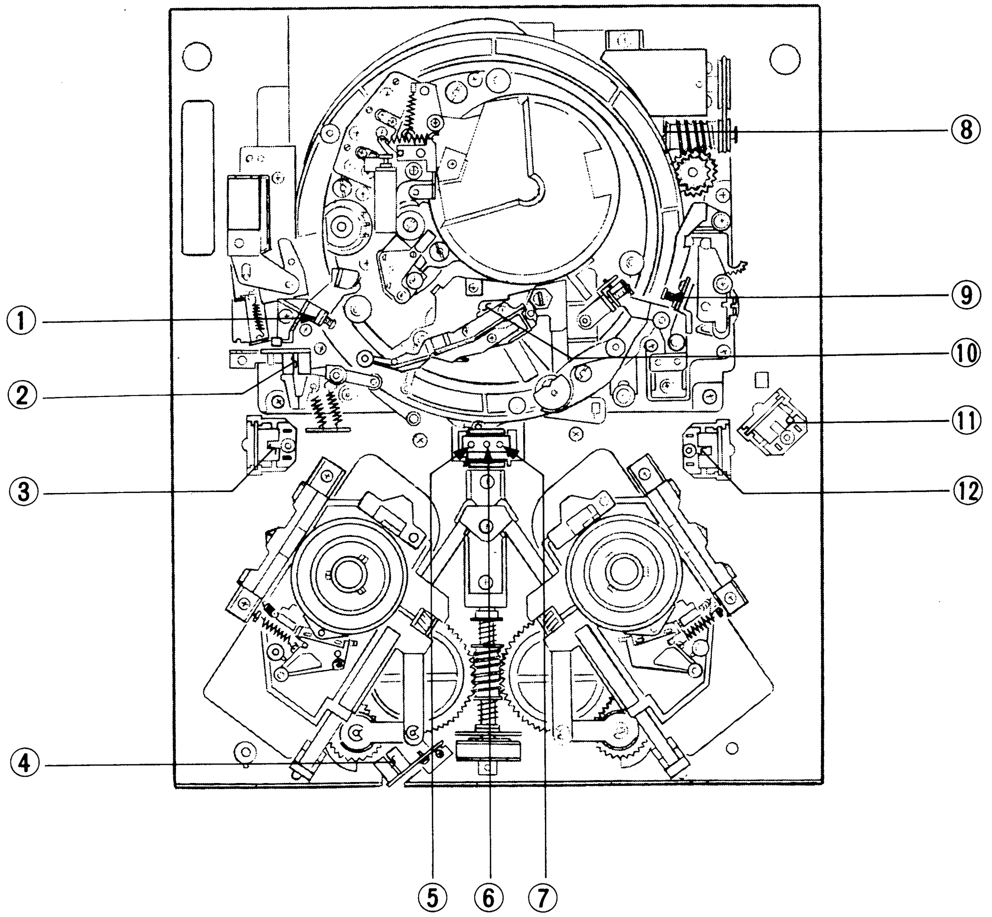


㉙ Drum
㉚ Take-up Reel Motor
㉛ Reel Transfer Motor
㉜ Search Dial Block
㉝ Capstan Motor
㉞ Supply Reel Motor

http://getMANUAL.com

2-4. LOCATION OF THE SENSORS

TOP VIEW



① Tape End Sensor
② Ring Sensor
③ S Cassette MISS-REC Switch (for metal particle tape)
④ Reel Table L/S Position Detection Sensor
⑤ Reel Hub Diameter Detection Switch
⑥ Oxide/Metal Particle Tape Detection Switch
⑦ Video Tape Thickness Detection Switch
⑧ Threading Speed Detection Sensor
⑨ Tape Beginning Sensor
⑩ Tape Tension Sensor
⑪ L Cassette MISS-REC Switch
⑫ S Cassette MISS-REC Switch (for oxide tape)

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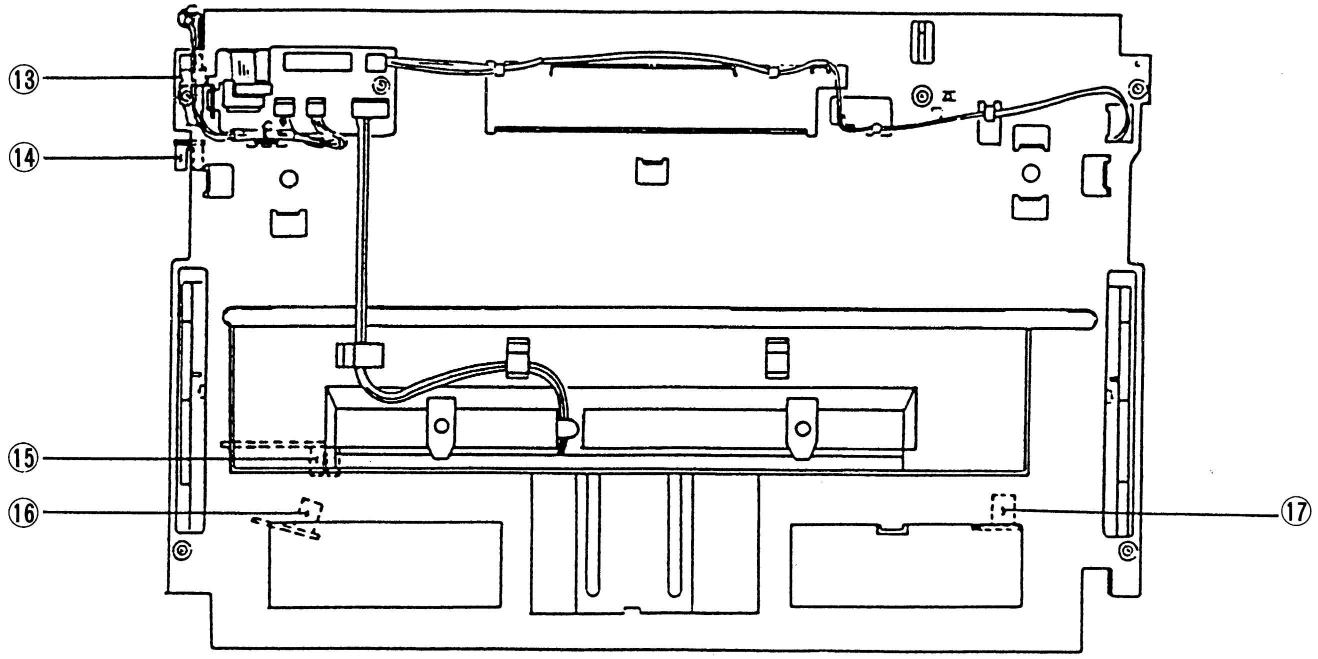
* The "S cassette" or "small cassette" described in the Maintenance Manual indicates a standard cassette.

TOP VIEW OF THE CASSETTE-UP COMPARTMENT



⑬ Cassette-down Switch (2)
⑭ Cassette-down Switch (1)
⑮ Cassette L/S Size Detection Switch
⑯ Cassette-in Switch (L)
⑰ Cassette-in Switch (R)

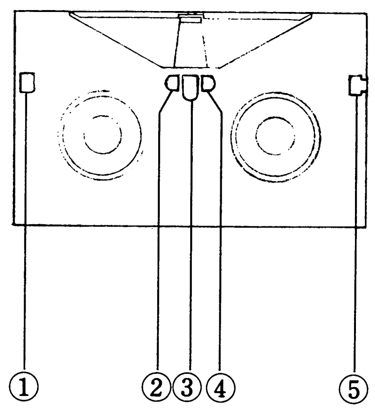
2-5. FUNCTIONS OF THE SENSORS AND CASSETTE TAB

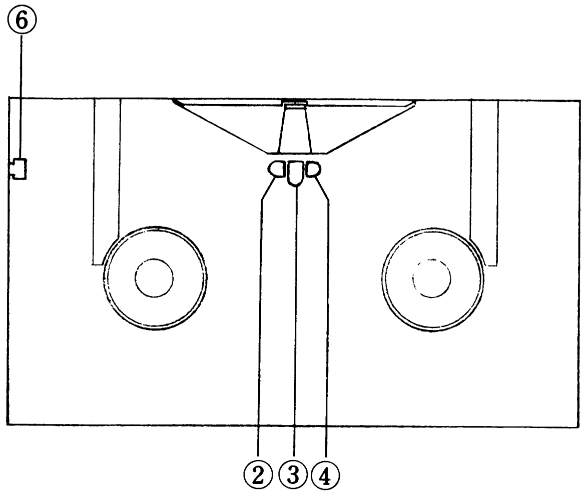
2-5-1. Function of the Sensors

1. Reel Table L/S Position Detection Sensor
   (Sec. 2-4- ④)
   . The sensor detects whether the Reel Table moves to the correct position according to the size of the inserted cassette.
2. Ring Sensor
   (Sec. 2-4 ②)
   . The sensor detects whether the Threading Ring reaches the THREAD END or UNTHREAD END position.
3. Tape Tension Sensor
   (Sec. 2-4- ⑩)
   . During recording or playback, a tension arm is activated to keep a constant tape tension at the drum entrance. The Tape Tension Sensor detects the position of the tension arm.
4. Threading Speed Detection Sensor
   (Sec. 2-4- ⑧)
   . During threading, the Threading Ring rotation speed is controlled using a servo circuit to protect the tape from damage. The Threading Ring rotation speed is detected using the Threading Speed Detection Sensor installed into the Gear Box Block.
5. S Cassette Miss-REC Switch
   (Sec. 2-4- ③)
   (for metal particle tape)
   . This is a record-proof switch for the small cassette for metal particle tape.
6. Reel Hub Diameter Detection Switch
   (Sec. 2-4- ⑤)
   . The reel hub diameter varies depending on the length of the tape wound on a cassette. The diameter is detected using the Reel Hub Diameter Detection Switch. The resultant data is sent to the servo circuit.
7. Oxide/Metal Particle Tape Detection Switch
   (Sec. 2-4- ⑥)
   . This switch detects whether an oxide tape or a metal particle tape is being used.
8. Video Tape Thickness Detection Switch
   (Sec. 2-5- ⑦)
   . This switch detects the thickness of the video tape wound on a cassette.
9. S Cassette Miss-REC Switch (for oxide tape)
   (Sec. 2-4- ⑫)
   . This is a record-proof switch for the small cassette for oxide tape.
10. L Cassette Miss-REC Switch (for Oxide and Metal Tapes)
    (Sec. 2-4- ⑪)
    . This is a record-proof switch for the large cassette of Oxide and Metal tapes.
11. Cassette L/S Size Detection Switch
    (Sec. 2-4- ⑮)
    . This switch detects whether the inserted cassette is large or small.
12. Cassette-in Switch (L)/Cassette-in Switch (R)
    (Sec. 2-4- ⑯ , ⑰)
    . This switch detects whether a cassette is being inserted.
13. Cassette-down Switch (1)
    (Sec. 2-4- ⑭)
    . This switch detects whether a cassette is inserted and the Cassette-up Compartment goes down.
    . It detects whether the Cassette-up Compartment goes up in the EJECT mode.
14. Cassette-down Switch (2)
    (Sec. 2-4- ⑬)
    . This switch checks whether the Reel Table moves to the correct position according to the size of the inserted cassette.

2-5-2. Function of the Cassette Plug and Tab

As shown in the figure below, plugs and tabs are provided at the back of the video cassette.





① Small cassette's miss-REC (for Oxide tape)
② Vide tape thickness detection
③ Oxide/Metal tape detection
④ Reel hub diameter detection
⑤ Small cassette's miss-REC (for Metal tape)
⑥ Large cassette's miss-REC

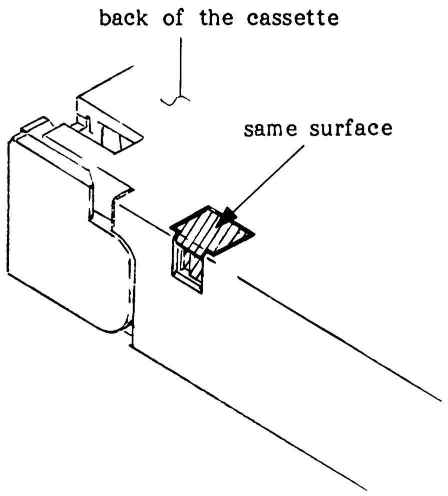


Fig. 1

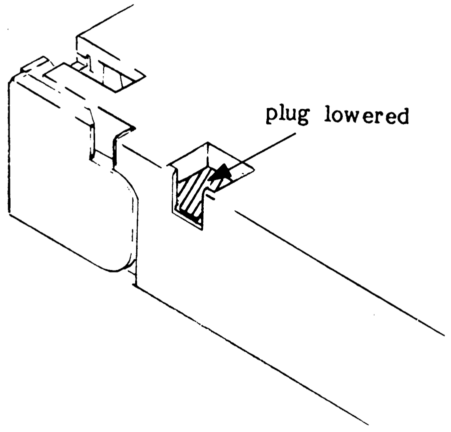


Fig. 2

The presence or absence of these plugs and tabs determines the cassette status as shown in the table below.

Plug and tab	Cassette status with plugs and tabs	Cassette status without plugs and tabs
Small cassette miss-REC (for oxide tape)	Can be recorded.	Cannot be recorded. * When recording is required, cover the former location of the tab with vinyl tape.
Small cassette miss-REC (for metal particle tape)	Can be recorded (the plug is located on the same surface as the back of the cassette) (refer to Fig. 1).	Cannot be recorded (the plug is lower than the back of the cassette) (refer to Fig. 2). * When recording is required, raise the plug.
Large cassette miss-REC	Can be recorded (the plug is located on the same surface as the back of the cassette) (refer to Fig. 1).	Cannot be recorded (the plug is lower than the back of the cassette) (refer to Fig. 2). * When recording is required, raise the plug.
Tape thickness	A 20µm thick tape is wound on the cassette.	A 15µm thick tape is wound on the cassette.
Oxide/Metal tape detection	An oxide tape is wound on the cassette.	A metal particle tape is wound on the cassette.
Reel hub diameter	For small hub	For large hub

2-6. PRINTED CIRCUIT BOARDS

The circuit information is provided below.

System	Board	Circuit function
VIDEO	DEC-46P	Y/C Separator
	DUS-288	Y/C Delay Adj.
	DEC-42P	C Decoder, C Compressor, Y Selector
	CF-36P	Color Framing Detector
	MD-46P	Y/C Modulator
	RP-29P(Y)	Y REC/PB Amplifier
	RP-29P(C)	C REC/PB Amplifier
	DM-56P	Y/C Demodulator
	DUS-259	Metal/Oxide LPF Switch
	DUS-269	C RF Phase Equalizer
	DUS-288	DO RF EQ.
	EQ-26	RF EQ.
	EQ-28	RF EQ.
	TBC-7D/7E	Time Base Corrector
	TBC-12P	Time Base Corrector
	NR-32	Y Digital Noise Reduction, Read Clock Generator
	TBC-9P	Time Base Corrector
	EN-48P	C Encoder
	VO-18P	Video Output
	DUS-270	Squelch Buffer
	RE-34	Rotary Erase
	CP-103P	Sub Control Panel
	CP-101P	Video/Audio Input

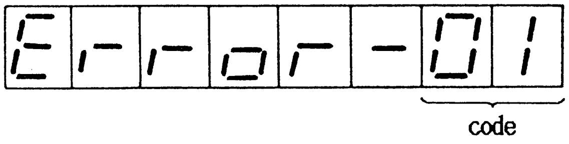
System	Board	Circuit function
AUDIO	BF-28	Audio Buffer/Level Detector
	VR-42	Audio REC/PB Volume
	AU-75P	LNG Audio REC/PB Amplifier
	DUS-295	Cross Talk Cancel EQ.
	AU-76P	LNG Audio Head Amplifier, Bias Oscillator
	AFM-1	AFM Audio Modulator/Demodulator
	FL-61	Low-Pass Filter
	CP-111 CP-161A	Audio Output Amplifier/Driver
	CP-113	Audio Balanced Amplifier
	HP-33	Headphones Amplifier/Jack
	VR-62	Headphones Level Volume
	DP-74	Audio Level Meter
	DP-73	DC-AC/DC Converter
	SW-144	Select Switch/Display
	DP-72	Video/RF Meter LED
	VR-61	Video/Tracking Control Volume
SERVO	SV-82	Microcomputer Servo
	SV-83A	Reel Servo
	SV-84P	Drum/Capstan Servo
	RE-28	Drum/Capstan Motor Driver
	PTC-20	Cassette Detector (Tape Thickness, Reel Hub Diameter, Metal/Oxide)
	PTC-21	Reel Motor Position Detector
	PTC-23	REC Inhibit Detector
	PTC-36	Cassette Detector (Tape Thickness, Reel Hub Diameter, Metal/Oxide)

System	Board	Circuit function
SERVO	DR-56	Capstan/Reel Motor Driver & Drum Error Amplifier
	RE-36	Reel Motor Driver
	RM-40	Reel Motor
	DE-15	Reel Motor FG
	SE-57	Threading Motor Control
	PTC-31	Threading Motor FG
	TR-18	Tape Tension Sensor
SYSTEM CONTROL	SY-61	System Control
	SY-64P	Time Code Reader/ Generator
	RM-57	Remote Connector
	PD-35	Pinch/Cleaning Solenoid
	PTC-15	Thread/Unthread End Sensor
	CL-14	Cassette-up Compartment
	CL-24	Cassette-up Compartment LED
	PC-47	Large/Small Cassette Detector
	PC-33	Cassette Down Detector
	PC-41	Cassette In Detector
	CCM-2	UP/DOWN Motor
	HC-11	Hours Meter
	KY-96A	Keyboard
	KY-107	Keyboard
	KY-108	Keyboard
	DP-71	Time Counter Display
	PTC-32	Search Dial
	PT-9	Power Transistor
	TC-40P	LTC REC/PB Amplifier, Erase Driver
OTHERS	AC-96	Relay Board of AC Inlet
	M1	Switching Regulator
	M2	Switching Regulator
	C1	Switching Regulator
	C2	Switching Regulator
	MB-191A	Mother Board
	MB-192	Mother Board
	EX-116	Extension Board
	EX-134	Extension Board
	EX-151	Extension Board

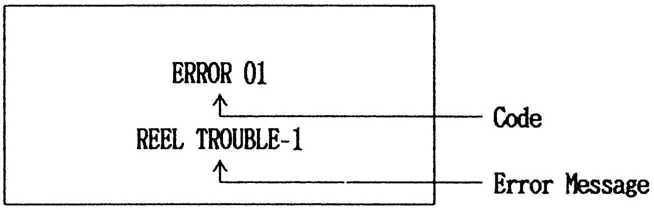
2-7. SELF DIAGNOSIS FUNCTION

The unit has a self diagnosis to isolate the troubles described below. When the troubles are detected, an error message is displayed on the function control panel's time counter display and monitor television. (To display the error message on the monitor television, connect a monitor television to the VIDEO OUT-3 connector on the connector panel and set the CHARACTER ON/OFF switch on the SY-61 board to on.)

Time counter display on the function control panel

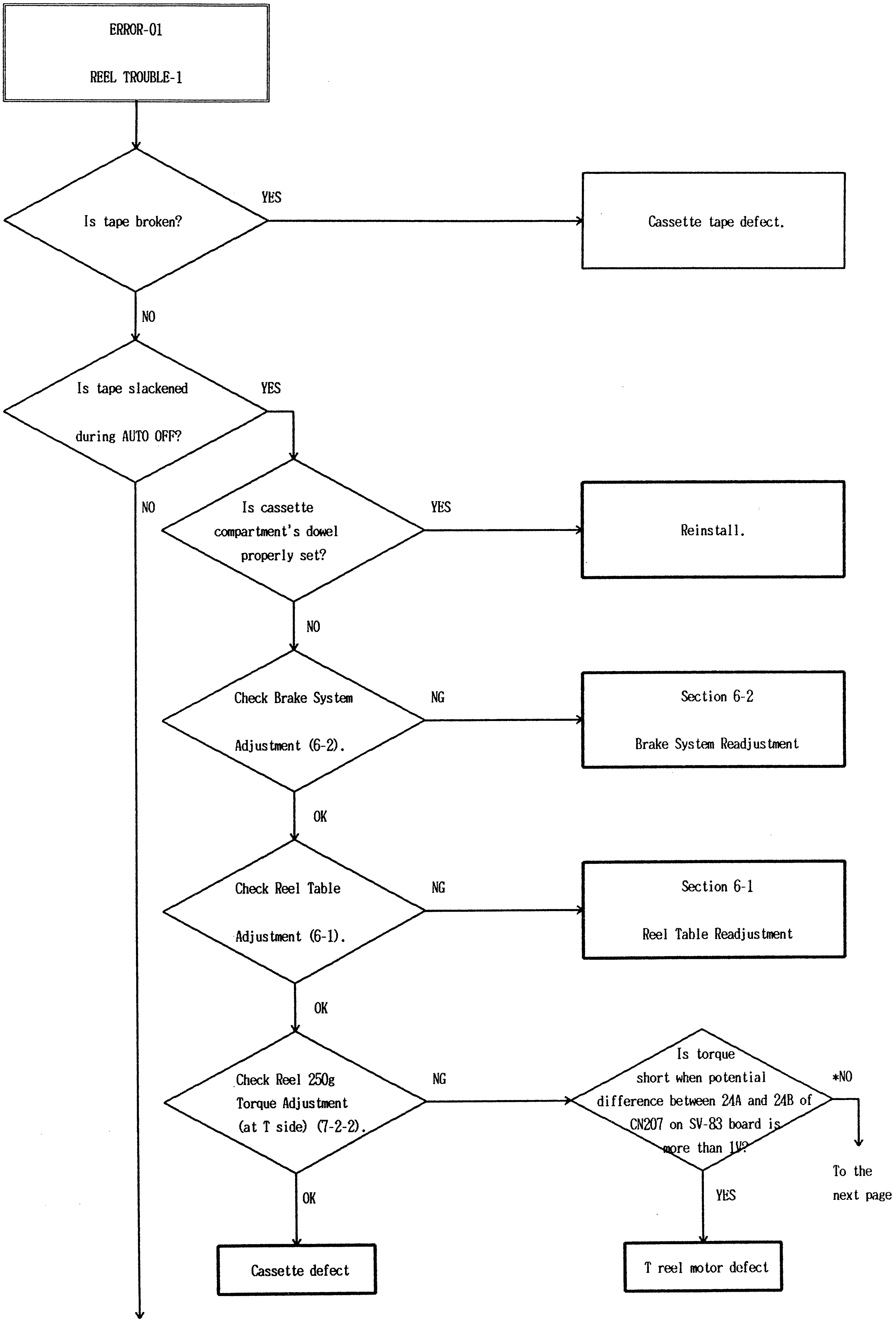


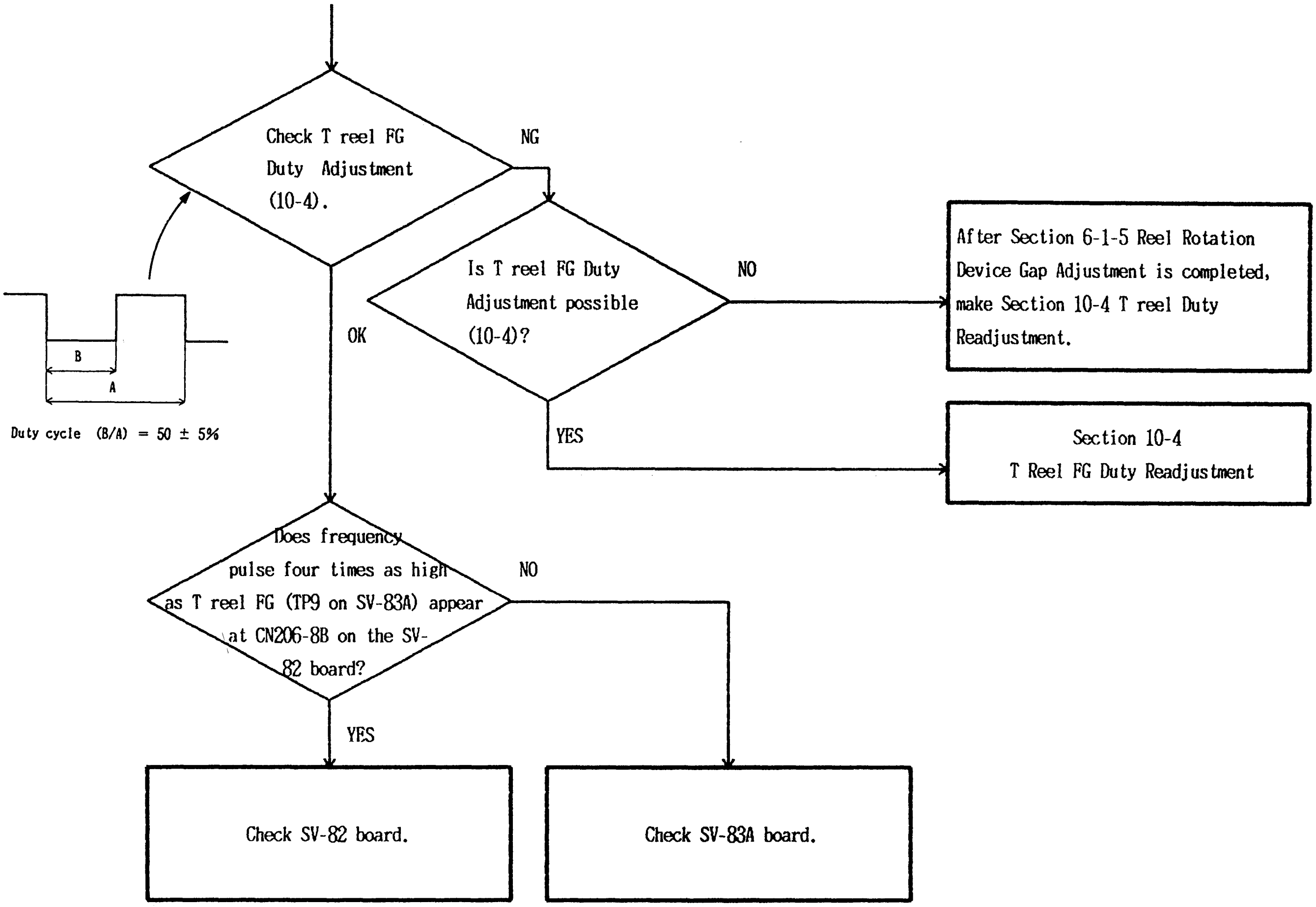
CHARACTER display



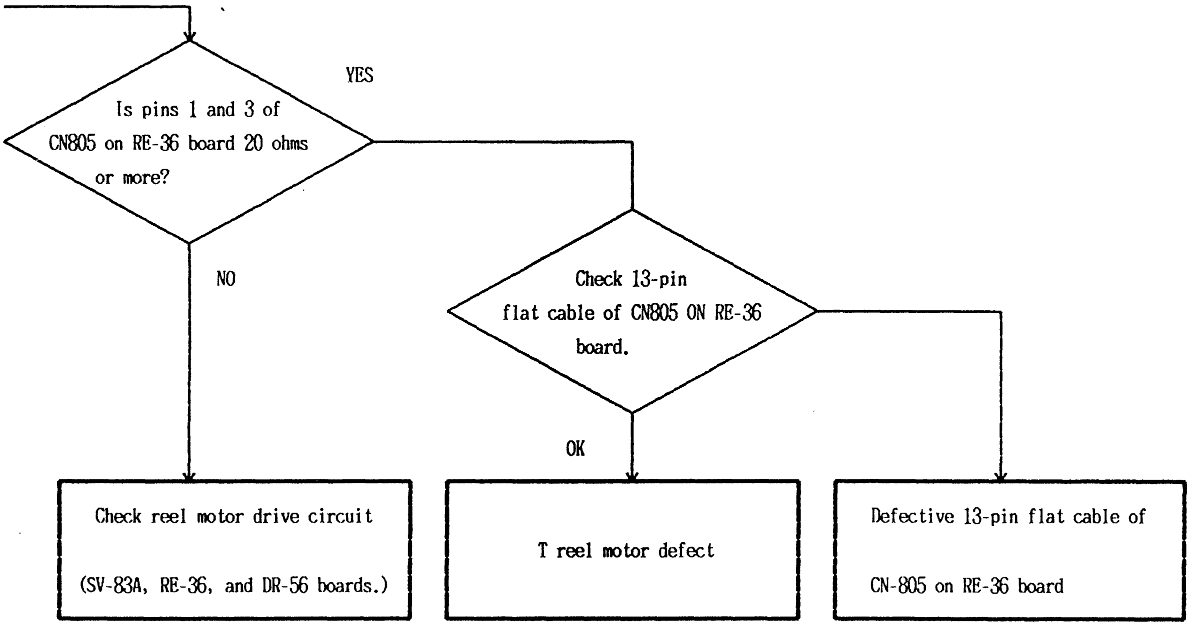
Code	Error message	Description	Detection
01	REEL TROUBLE-1	When tape slacking is detected during unthreading or tape breaking is detected during threading, tape protection operation is done and this message is displayed.	Detected when the ratio of the FG frequency at a take-up reel and threading ring is less than the specified value.
02	REEL TROUBLE-2	When tape breaking is detected in REC, SEARCH, F.FWD, and REW modes, tape protection operation is done and this message is displayed.	Detected when the ratio of the FG frequency at a supply reel and take-up reel is less than the specified value.
03	REEL TROUBLE-3	When tape breaking is detected or either of the locked supply or take-up reel is detected, tape protection operation is done and this message is displayed.	Detected when the ratio of the FG frequency at a supply or take-up reel is zero (0), or when the tension detected from a tension sensor is less than 15g.
04	REEL TROUBLE-4	When the tape does not run at the speed designated in F.FWD and REW modes, tape protection operation is done and this message is displayed.	Detected when the tape speed using the FG frequency at supply and take-up reels is compared with the designated speed.
05	REEL TROUBLE-5	Detected when the supply and take-up reels cannot be stopped with the cassette not inserted.	Detected using the FG frequency at supply and take-up reels.
06	TAPE TENSION ERROR	When excessive tension is detected, tape protection operation is done this message is displayed.	Detected when the tension detected from a tension sensor is more than 55g.
07	CAPSTAN TROUBLE	When the tape does not run at the speed designated in PLAY and SEARCH modes, tape protection operation is done and this message is displayed.	Detected at the tape speed detected from the FG frequency at a capstan motor.
08	DRUM TROUBLE	When drum motor rotation is not normal, tape protection operation is done and this message is displayed.	Detected when the drum speed obtained from the drum motor's phase PG and speed PG is less than the specified value or when the drum servo is not locked for more than the specified time.
09	TH/UNTH MOTOR TIME OUT	When threading or unthreading is not completed, tape protection operation is done and this message is displayed.	Detected when threading or unthreading is not completed within ten seconds after it is started.
0A	THREADING TROUBLE	When threading connot be done, tape protection operation is done and this message is displayed.	Detected when the FG frequency at a take-up reel cannot be detected during threading or the tape beginnig sensor is activated after the short FF mode is automatically entered three times.
10	HUMID	Displayed when humid condensation is detected.	Detected using a condensation sensor.
11	TAPE BEGINNING/END SENSOR	Displayed when the tape beginning and end sensor operation is defective.	Detected when the tape beginning and end are detected at the same time.
12	TAPE BEGINNING SENSOR TROUBLE	Displayed when the tape beginning sensor operation is defective.	Detected when the tape beginning continues for more than seven seconds.
13	TAPE END SENSOR TROUBLE	Displayed when the tape end sensor operation is defective.	Detected when the tape end continues for more than seven seconds.

Code	Error message	Description	Detection
14	FAN MOTOR TROUBLE	Displayed when the operation of the fan motor on the connector panel is defective.	Detected according to the period of a ripple noise at the fan motor terminal.
20	CASSETTE COMPARTMENT MOTOR LOCK	When cassette up/down operation is not completed, tape protection is done and this message is displayed.	Detected when cassette up/down operation is not completed within four seconds after it is started.
21	REEL TABLE MOTOR LOCK TROUBLE	When driving of L to S or S to L in the reel table is not completed, tape protection operation is done and this message is displayed.	Detected when reel table driving is not completed within four seconds after it is started.
22	REEL TABLE SENSOR TROUBLE	Displayed when reel table's L/S position detection sensor operation is defective.	Detected when the large and small positions are detected at the same time.
23	THREADING RING SENSOR TROUBLE	Displayed when defects occur in the threading ring's position detection.	Displayed when defects occur in the threading ring's position detection.
90	KEY INTERFACE ERROR-1	Displayed when the interface between the keyboard and system control is defective.	Detected when no interface signal is sent from the system control to the keyboard.
92	SERVO INTERFACE ERROR-1	Displayed when the interface between the keyboard and system control is defective.	Detected when no interface signal is sent form the servo system to the system control.
93	SERVO INTERFACE ERROR-2	Displayed when the interface between the keyboard and system control is defective.	Detected when no interface signal is sent from the system control to the servo system.
94	TC BOARD INTERFACE ERROR	Displayed when the interface between the REC timing control microcomputer and system control on the TC-40 and TC-40P boards is defective.	Detected when the interface signal sent from the REC timing control microprocessor to the system control is defective.
95	SY CPU INTERFACE ERROR	Displayed when the interface between CPU1 and CPU2 on the SY-61 board is defective.	Detected when data is not receive or sent properly between CPU1 and CPU2 during power on sequence.
96	NV-RAM TROUBLE	Displayed when a defective NV-RAM is detected on the SY-61 board.	Detected by the NV-RAM data's checksum.


ERROR-01
REEL TROUBLE-1
Is tape broken?
YES
Cassette tape defect.
NO
Is tape slackened during AUTO OFF?
YES
NO
Is cassette compartment's dowel properly set?
YES
Reinstall.
NO
Check Brake System Adjustment (6-2).
NG
Section 6-2
Brake System Readjustment
OK
Check Reel Table Adjustment (6-1).
NG
Section 6-1
Reel Table Readjustment
OK
Check Reel 250g Torque Adjustment (at T side) (7-2-2).
NG
Is torque short when potential difference between 24A and 24B of CN207 on SV-83 board is more than 1V?
*NO
To the next page
YES
T reel motor defect
OK
Cassette defect


Check T reel FG Duty Adjustment (10-4).
NG
OK
Is T reel FG Duty Adjustment possible (10-4)?
NO
YES
After Section 6-1-5 Reel Rotation Device Gap Adjustment is completed, make Section 10-4 T reel Duty Readjustment.
Section 10-4 T Reel FG Duty Readjustment
B
A
Duty cycle (B/A) = 50 ± 5%
Does frequency pulse four times as high as T reel FG (TP9 on SV-83A) appear at CN206-8B on the SV-82 board?
NO
YES
Check SV-82 board.
Check SV-83A board.

From page 2-21 *NO


Is pins 1 and 3 of CN805 on RE-36 board 20 ohms or more?
YES
NO
Check 13-pin flat cable of CN805 ON RE-36 board.
OK
Check reel motor drive circuit
(SV-83A, RE-36, and DR-56 boards.)
T reel motor defect
Defective 13-pin flat cable of
CN-805 on RE-36 board

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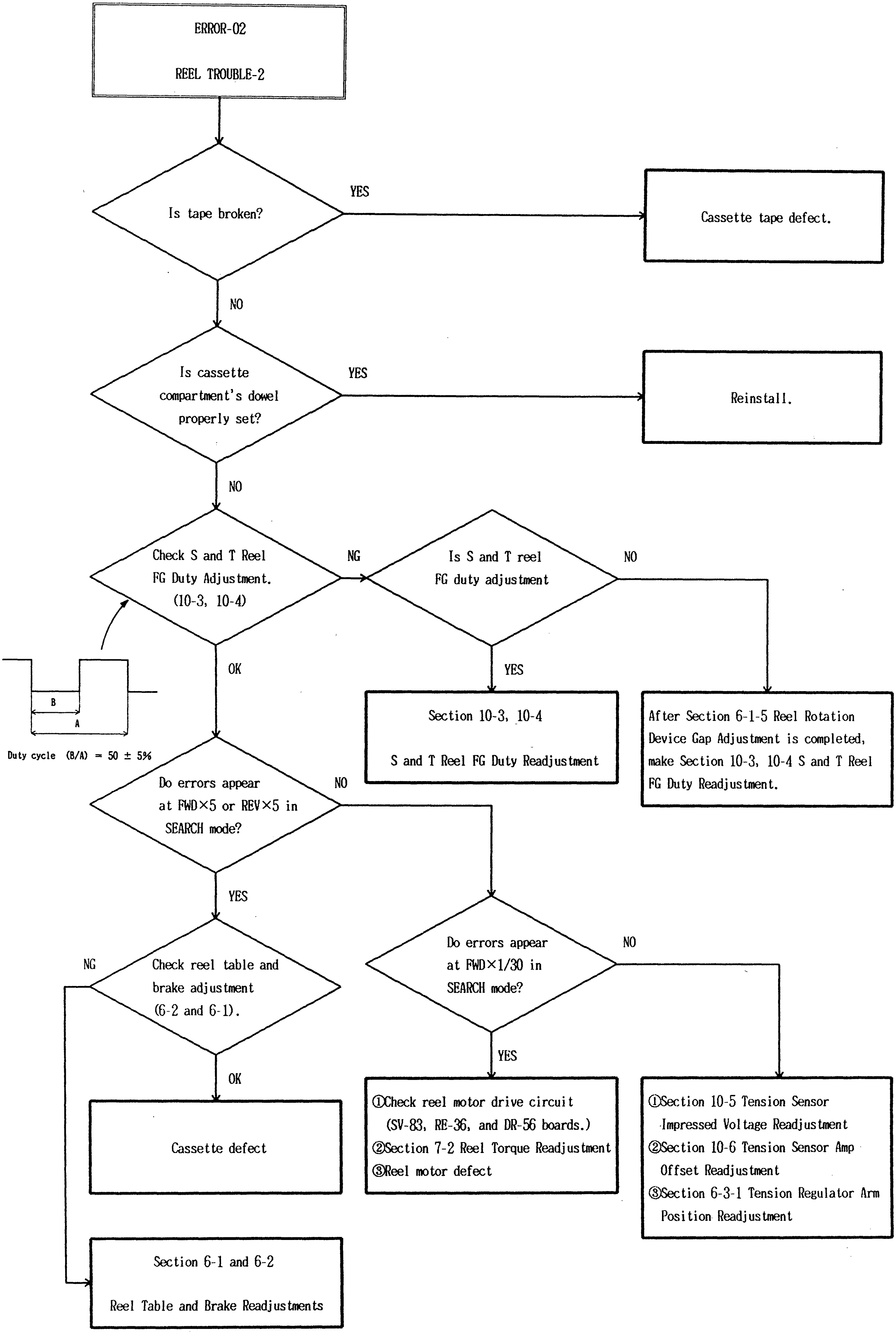
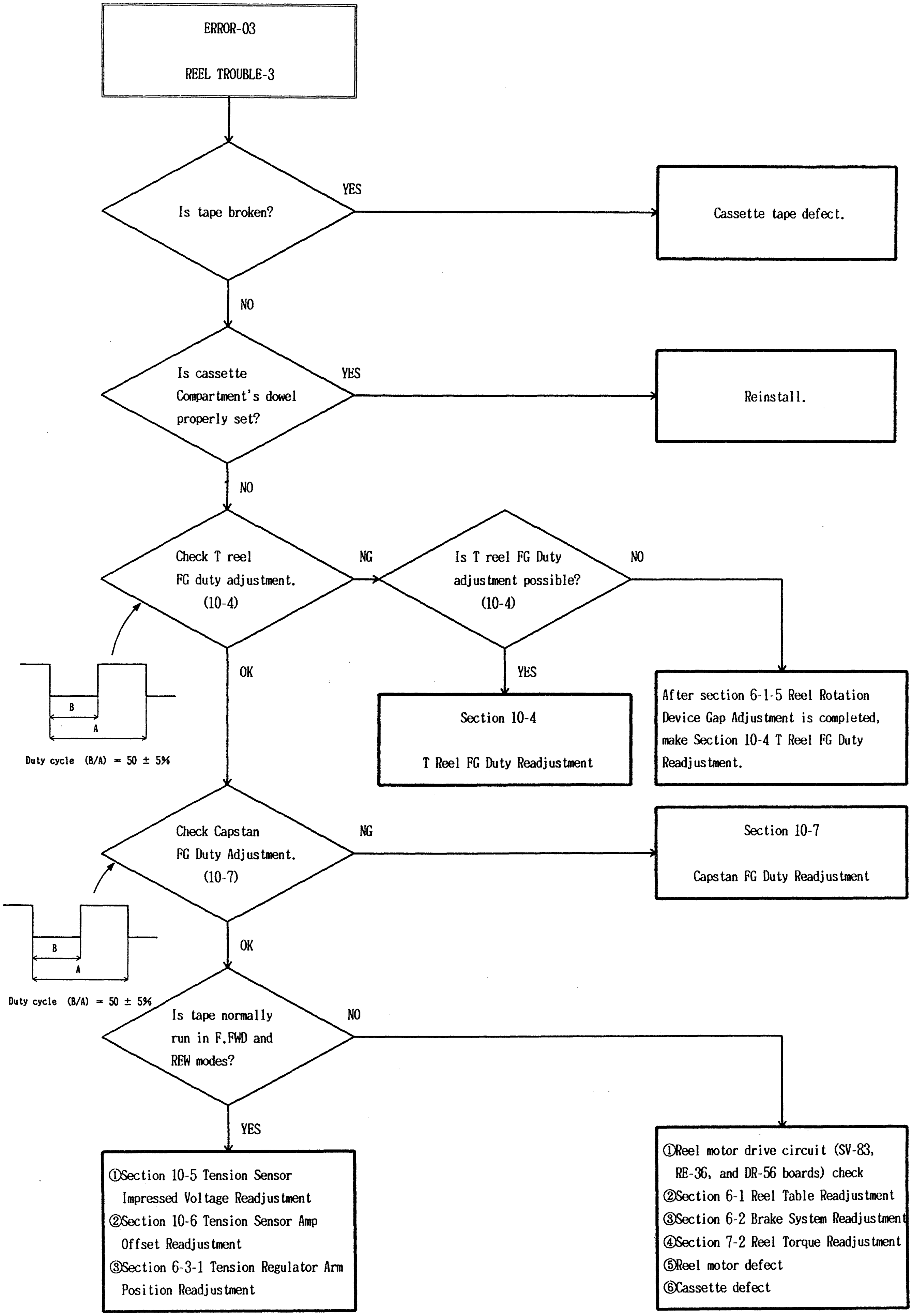
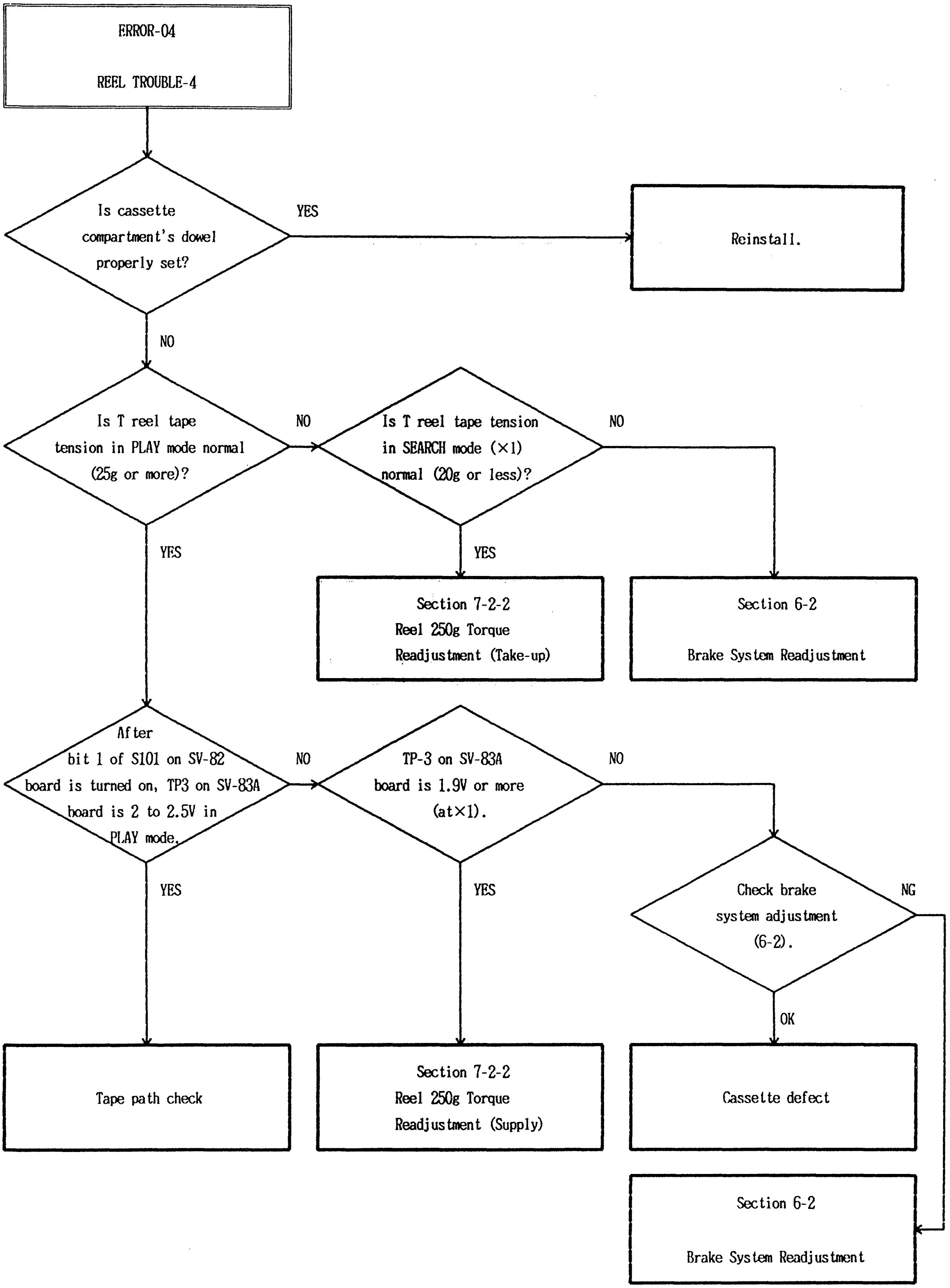
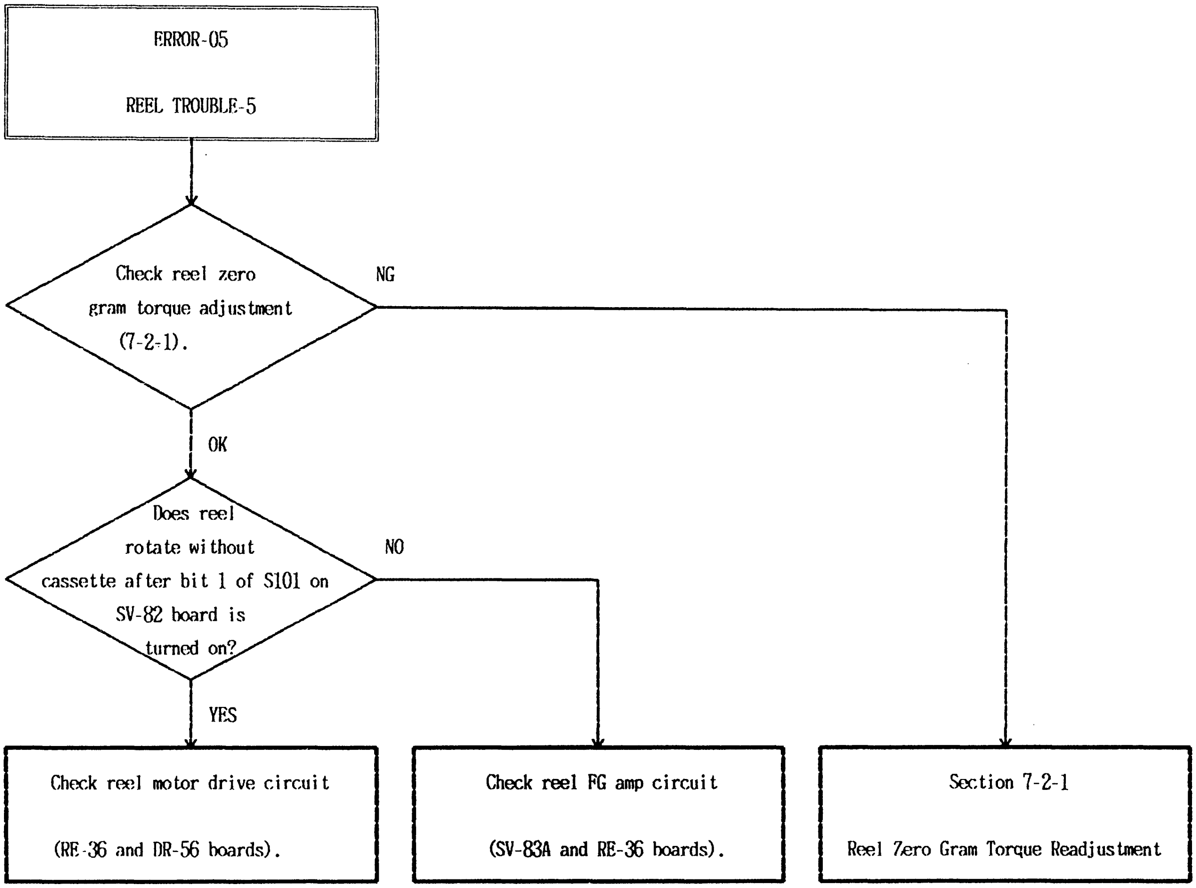
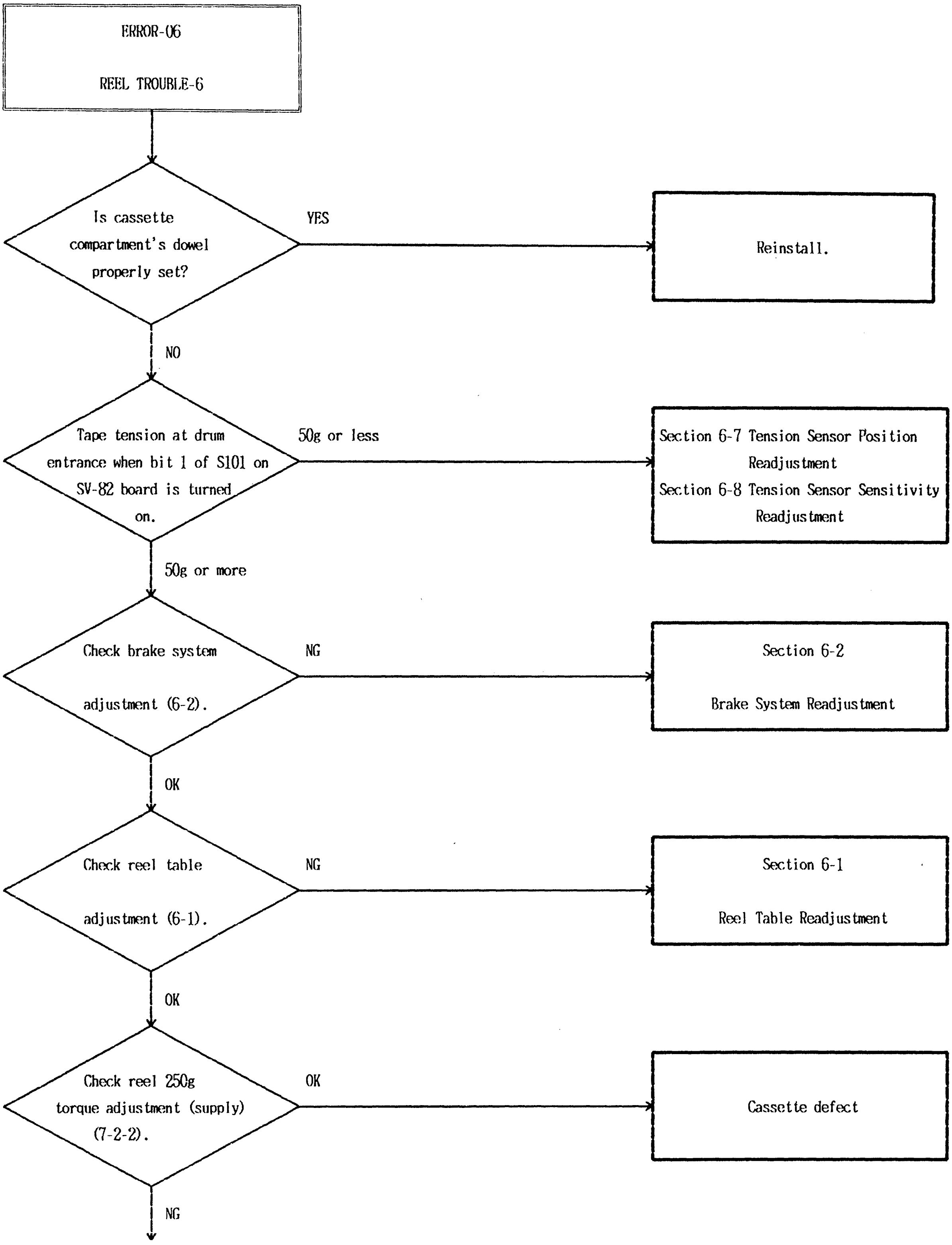
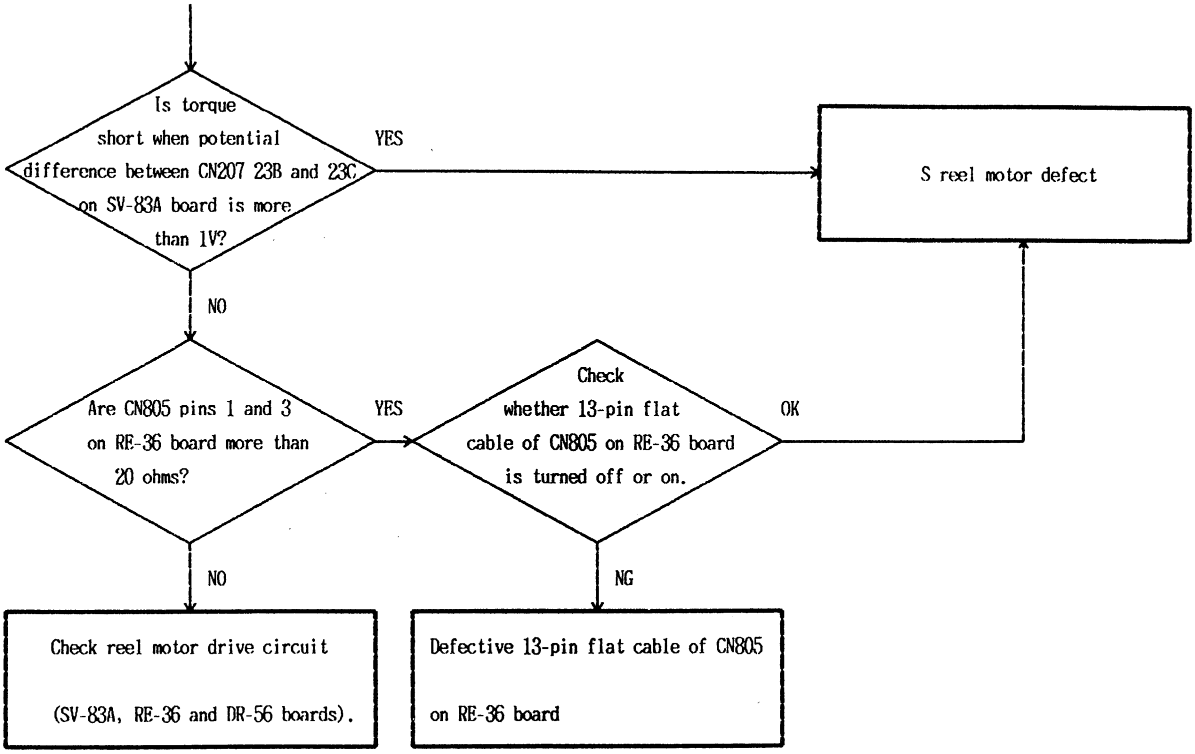

ERROR-02
REEL TROUBLE-2
Is tape broken?
YES
Cassette tape defect.
NO
Is cassette compartment's dowel properly set?
YES
Reinstall.
NO
Check S and T Reel FG Duty Adjustment. (10-3, 10-4)
NG
Is S and T reel FG duty adjustment
NO
YES
Section 10-3, 10-4
S and T Reel FG Duty Readjustment
After Section 6-1-5 Reel Rotation Device Gap Adjustment is completed, make Section 10-3, 10-4 S and T Reel FG Duty Readjustment.
OK
B
A
Duty cycle (B/A) = 50 ± 5%
Do errors appear at FWD×5 or REV×5 in SEARCH mode?
NO
YES
Check reel table and brake adjustment (6-2 and 6-1).
NG
OK
Cassette defect
Section 6-1 and 6-2
Reel Table and Brake Readjustments
Do errors appear at FWD×1/30 in SEARCH mode?
NO
YES
①Check reel motor drive circuit (SV-83, RE-36, and DR-56 boards.)
②Section 7-2 Reel Torque Readjustment
③Reel motor defect
①Section 10-5 Tension Sensor Impressed Voltage Readjustment
②Section 10-6 Tension Sensor Amp Offset Readjustment
③Section 6-3-1 Tension Regulator Arm Position Readjustment

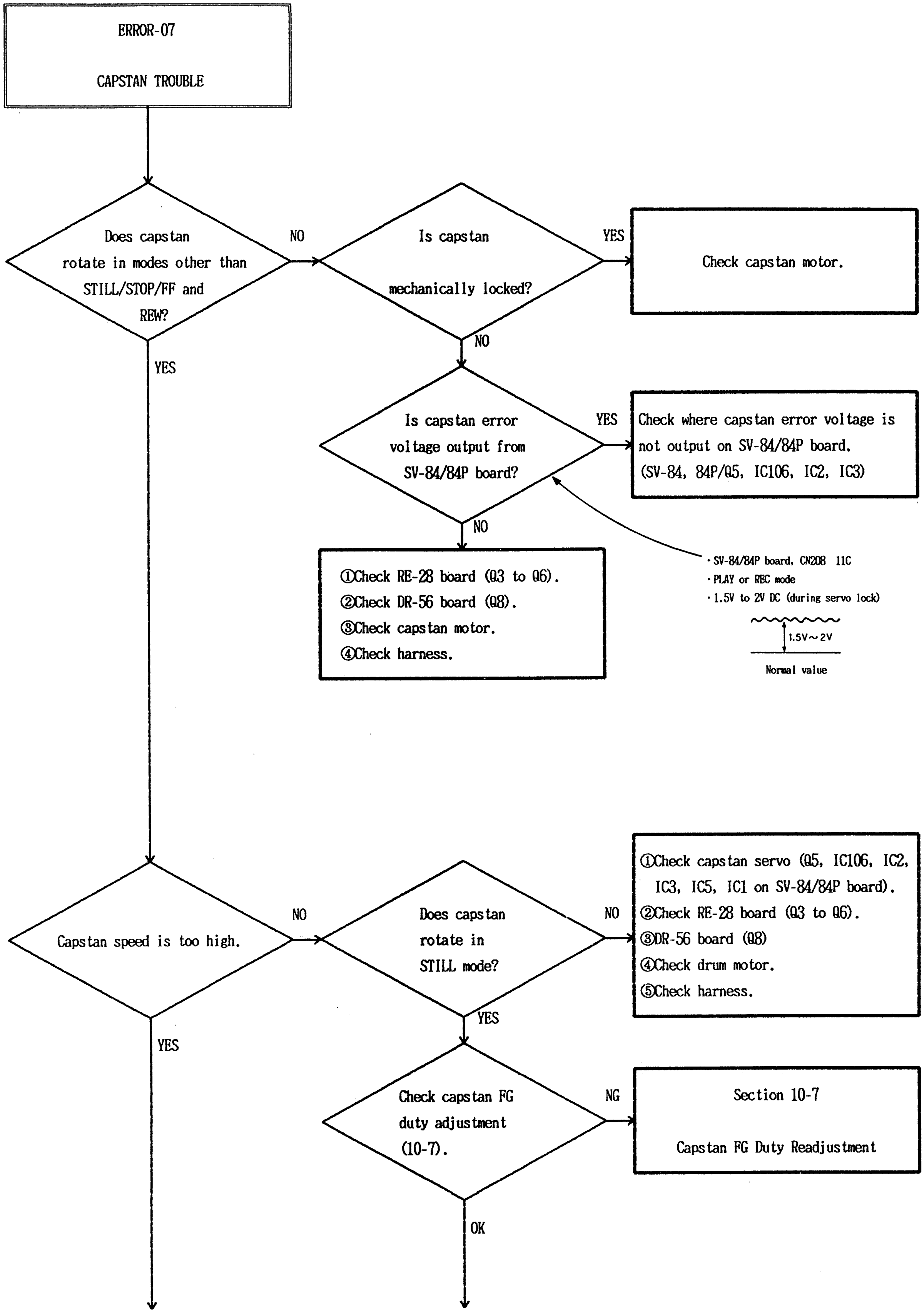

ERROR-03
REEL TROUBLE-3
Is tape broken?
YES
Cassette tape defect.
NO
Is cassette Compartment's dowel properly set?
YES
Reinstall.
NO
Check T reel FG duty adjustment. (10-4)
NG
Is T reel FG Duty adjustment possible? (10-4)
NO
YES
Section 10-4 T Reel FG Duty Readjustment
After section 6-1-5 Reel Rotation Device Gap Adjustment is completed, make Section 10-4 T Reel FG Duty Readjustment.
OK
B
A
Duty cycle (B/A) = 50 ± 5%
Check Capstan FG Duty Adjustment. (10-7)
NG
Section 10-7 Capstan FG Duty Readjustment
OK
B
A
Duty cycle (B/A) = 50 ± 5%
Is tape normally run in F.FWD and REW modes?
NO
YES
①Section 10-5 Tension Sensor Impressed Voltage Readjustment
②Section 10-6 Tension Sensor Amp Offset Readjustment
③Section 6-3-1 Tension Regulator Arm Position Readjustment
①Reel motor drive circuit (SV-83, RE-36, and DR-56 boards) check
②Section 6-1 Reel Table Readjustment
③Section 6-2 Brake System Readjustment
④Section 7-2 Reel Torque Readjustment
⑤Reel motor defect
⑥Cassette defect

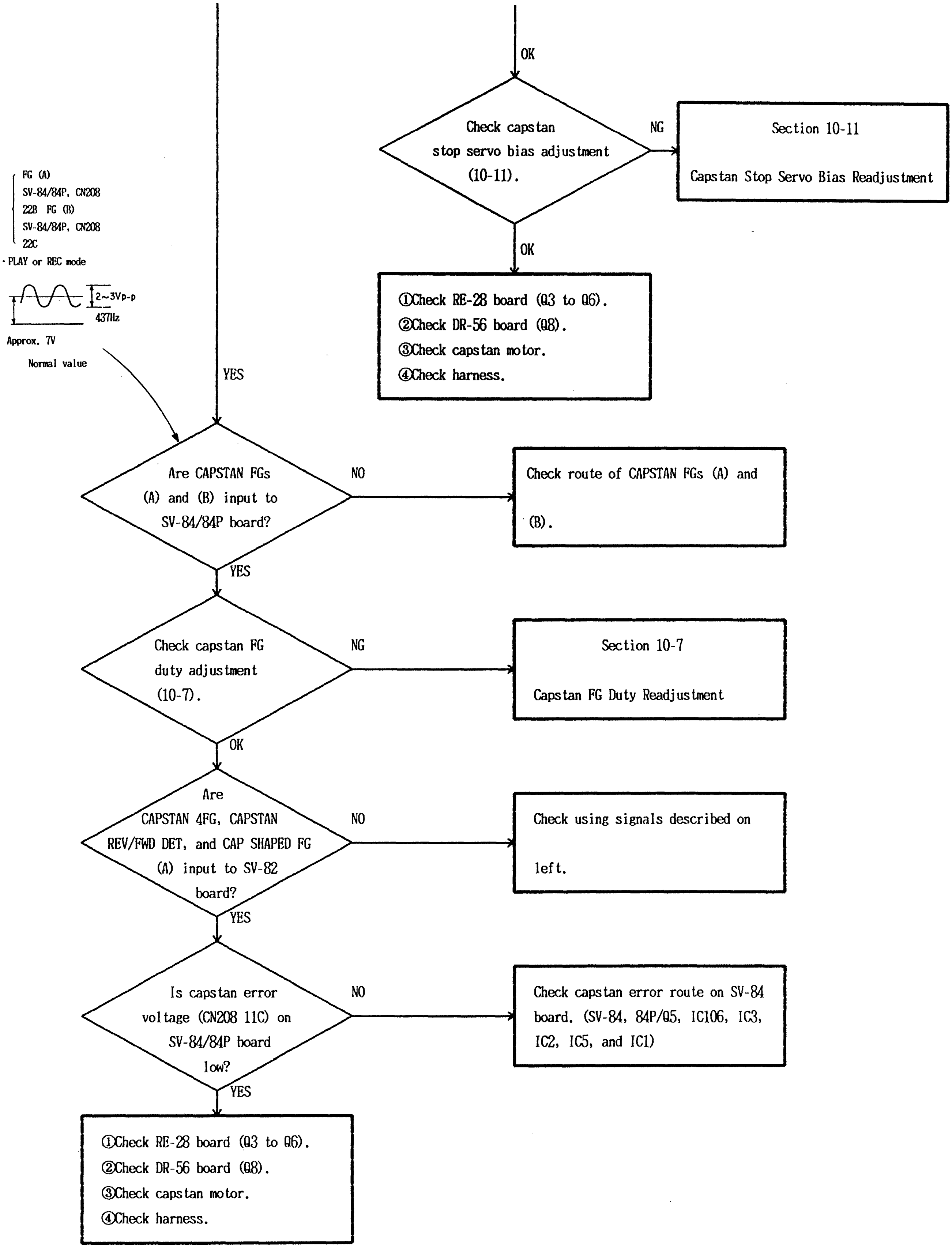

ERROR-04
REEL TROUBLE-4
Is cassette compartment's dowel properly set?
YES
Reinstall.
NO
Is T reel tape tension in PLAY mode normal (25g or more)?
NO
Is T reel tape tension in SEARCH mode (×1) normal (20g or less)?
NO
YES
Section 7-2-2 Reel 250g Torque Readjustment (Take-up)
Section 6-2 Brake System Readjustment
YES
After bit 1 of S101 on SV-82 board is turned on, TP3 on SV-83A board is 2 to 2.5V in PLAY mode.
NO
TP-3 on SV-83A board is 1.9V or more (at×1).
NO
YES
YES
Check brake system adjustment (6-2).
NG
OK
Tape path check
Section 7-2-2 Reel 250g Torque Readjustment (Supply)
Cassette defect
Section 6-2 Brake System Readjustment


ERROR-05
REEL TROUBLE-5
Check reel zero gram torque adjustment (7-2-1).
NG
OK
Does reel rotate without cassette after bit 1 of S101 on SV-82 board is turned on?
NO
YES
Check reel motor drive circuit (RE-36 and DR-56 boards).
Check reel FG amp circuit (SV-83A and RE-36 boards).
Section 7-2-1
Reel Zero Gram Torque Readjustment

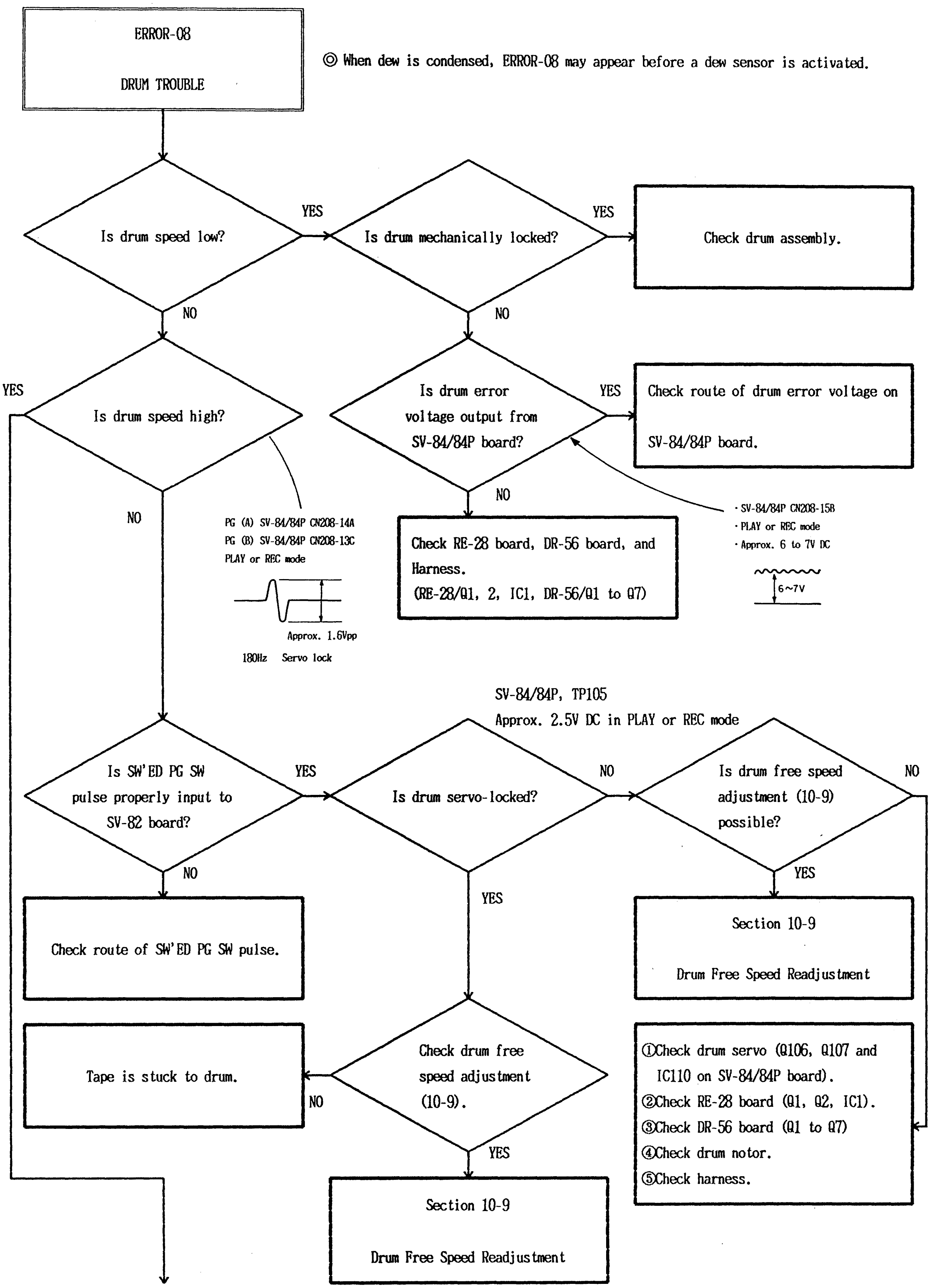

ERROR-06
REEL TROUBLE-6
Is cassette compartment's dowel properly set?
YES
Reinstall.
NO
Tape tension at drum entrance when bit 1 of S101 on SV-82 board is turned on.
50g or less
Section 6-7 Tension Sensor Position Readjustment
Section 6-8 Tension Sensor Sensitivity Readjustment
50g or more
Check brake system adjustment (6-2).
NG
Section 6-2
Brake System Readjustment
OK
Check reel table adjustment (6-1).
NG
Section 6-1
Reel Table Readjustment
OK
Check reel 250g torque adjustment (supply) (7-2-2).
OK
Cassette defect
NG

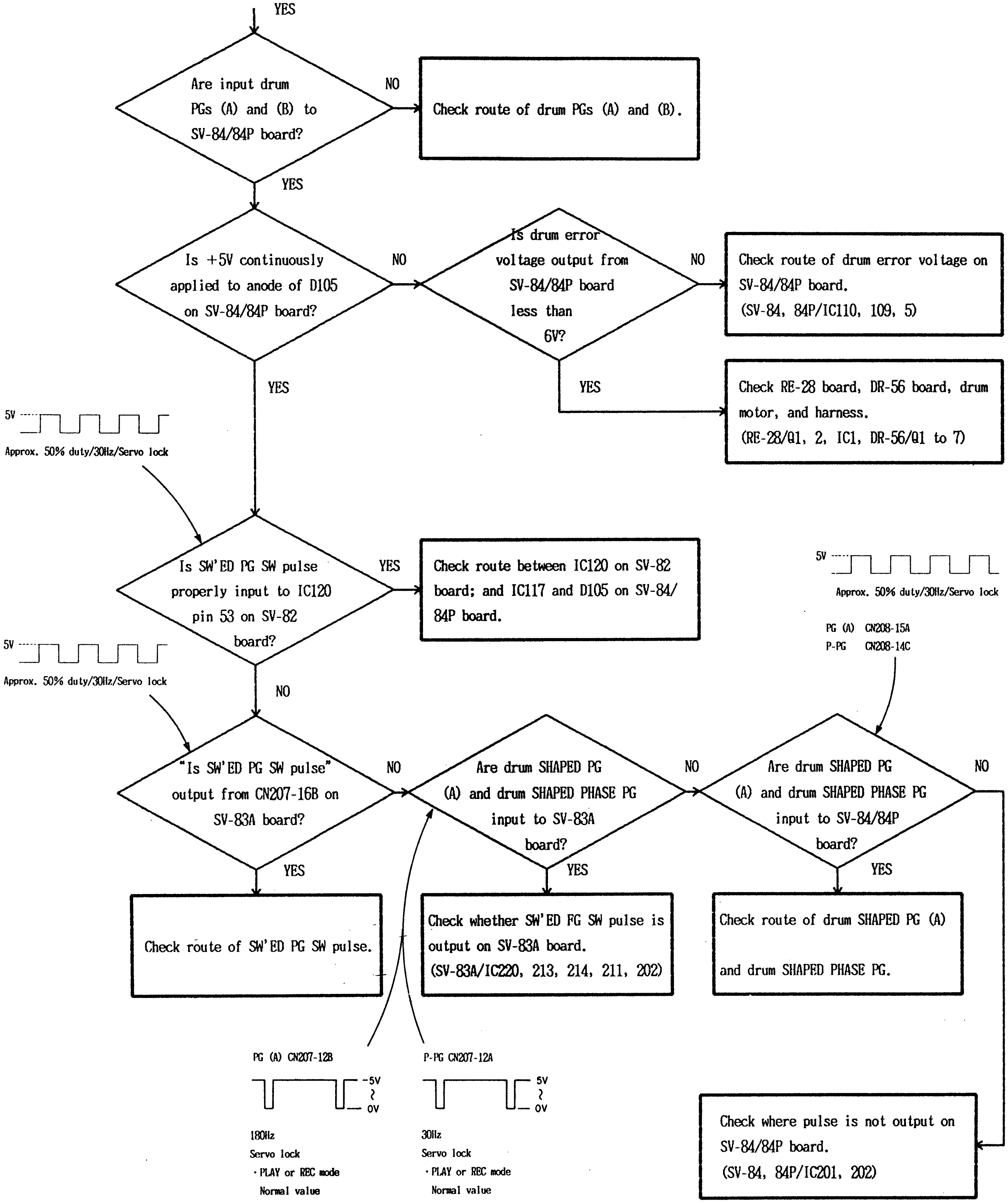

Is torque short when potential difference between CN207 23B and 23C on SV-83A board is more than 1V?
YES
S reel motor defect
NO
Are CN805 pins 1 and 3 on RE-36 board more than 20 ohms?
YES
Check whether 13-pin flat cable of CN805 on RE-36 board is turned off or on.
OK
NO
NG
Check reel motor drive circuit (SV-83A, RE-36 and DR-56 boards).
Defective 13-pin flat cable of CN805 on RE-36 board


ERROR-07
CAPSTAN TROUBLE
Does capstan rotate in modes other than STILL/STOP/FF and REW?
NO
Is capstan mechanically locked?
YES
Check capstan motor.
NO
YES
Is capstan error voltage output from SV-84/84P board?
YES
Check where capstan error voltage is not output on SV-84/84P board. (SV-84, 84P/Q5, IC106, IC2, IC3)
NO
①Check RE-28 board (Q3 to Q6).
②Check DR-56 board (Q8).
③Check capstan motor.
④Check harness.
・SV-84/84P board, CN208 11C
・PLAY or REC mode
・1.5V to 2V DC (during servo lock)
1.5V~2V
Normal value
Capstan speed is too high.
NO
Does capstan rotate in STILL mode?
NO
①Check capstan servo (Q5, IC106, IC2, IC3, IC5, IC1 on SV-84/84P board).
②Check RE-28 board (Q3 to Q6).
③DR-56 board (Q8)
④Check drum motor.
⑤Check harness.
YES
YES
Check capstan FG duty adjustment (10-7).
NG
Section 10-7
Capstan FG Duty Readjustment
OK


OK
Check capstan stop servo bias adjustment (10-11).
NG
Section 10-11
Capstan Stop Servo Bias Readjustment
OK
①Check RE-28 board (Q3 to Q6).
②Check DR-56 board (Q8).
③Check capstan motor.
④Check harness.
FG (A)
SV-84/84P, CN208
22B FG (B)
SV-84/84P, CN208
22C
· PLAY or REC mode
2~3Vp-p
437Hz
Approx. 7V
Normal value
YES
Are CAPSTAN FGs (A) and (B) input to SV-84/84P board?
NO
Check route of CAPSTAN FGs (A) and (B).
YES
Check capstan FG duty adjustment (10-7).
NG
Section 10-7
Capstan FG Duty Readjustment
OK
Are CAPSTAN 4FG, CAPSTAN REV/FWD DET, and CAP SHAPED FG (A) input to SV-82 board?
NO
Check using signals described on left.
YES
Is capstan error voltage (CN208 11C) on SV-84/84P board low?
NO
Check capstan error route on SV-84 board. (SV-84, 84P/Q5, IC106, IC3, IC2, IC5, and IC1)
YES
①Check RE-28 board (Q3 to Q6).
②Check DR-56 board (Q8).
③Check capstan motor.
④Check harness.

◎ When dew is condensed, ERROR-08 may appear before a dew sensor is activated.


ERROR-08
DRUM TROUBLE
Is drum speed low?
YES
Is drum mechanically locked?
YES
Check drum assembly.
NO
NO
YES
Is drum speed high?
Is drum error voltage output from SV-84/84P board?
YES
Check route of drum error voltage on SV-84/84P board.
NO
NO
PG (A) SV-84/84P CN208-14A
PG (B) SV-84/84P CN208-13C
PLAY or REC mode
Approx. 1.6Vpp
180Hz Servo lock
Check RE-28 board, DR-56 board, and Harness.
(RE-28/Q1, 2, IC1, DR-56/Q1 to Q7)
· SV-84/84P CN208-15B
· PLAY or REC mode
· Approx. 6 to 7V DC
6~7V
SV-84/84P, TP105
Approx. 2.5V DC in PLAY or REC mode
Is SW'ED PG SW pulse properly input to SV-82 board?
YES
Is drum servo-locked?
NO
Is drum free speed adjustment (10-9) possible?
NO
NO
YES
YES
Check route of SW'ED PG SW pulse.
Section 10-9
Drum Free Speed Readjustment
Tape is stuck to drum.
Check drum free speed adjustment (10-9).
NO
YES
①Check drum servo (Q106, Q107 and IC110 on SV-84/84P board).
②Check RE-28 board (Q1, Q2, IC1).
③Check DR-56 board (Q1 to Q7)
④Check drum notor.
⑤Check harness.
Section 10-9
Drum Free Speed Readjustment


YES
Are input drum PGs (A) and (B) to SV-84/84P board?
NO
Check route of drum PGs (A) and (B).
YES
Is +5V continuously applied to anode of D105 on SV-84/84P board?
NO
Is drum error voltage output from SV-84/84P board less than 6V?
NO
Check route of drum error voltage on SV-84/84P board.
(SV-84, 84P/IC110, 109, 5)
YES
Check RE-28 board, DR-56 board, drum motor, and harness.
(RE-28/Q1, 2, IC1, DR-56/Q1 to 7)
YES
5V
Approx. 50% duty/30Hz/Servo lock
Is SW'ED PG SW pulse properly input to IC120 pin 53 on SV-82 board?
YES
Check route between IC120 on SV-82 board; and IC117 and D105 on SV-84/84P board.
5V
Approx. 50% duty/30Hz/Servo lock
5V
Approx. 50% duty/30Hz/Servo lock
PG (A) CN208-15A
P-PG CN208-14C
NO
"Is SW'ED PG SW pulse" output from CN207-16B on SV-83A board?
NO
Are drum SHAPED PG (A) and drum SHAPED PHASE PG input to SV-83A board?
NO
Are drum SHAPED PG (A) and drum SHAPED PHASE PG input to SV-84/84P board?
NO
YES
Check route of SW'ED PG SW pulse.
YES
Check whether SW'ED FG SW pulse is output on SV-83A board.
(SV-83A/IC220, 213, 214, 211, 202)
YES
Check route of drum SHAPED PG (A) and drum SHAPED PHASE PG.
PG (A) CN207-12B
-5V
OV
180Hz
Servo lock
・PLAY or REC mode
Normal value
P-PG CN207-12A
5V
OV
30Hz
Servo lock
・PLAY or REC mode
Normal value
Check where pulse is not output on SV-84/84P board.
(SV-84, 84P/IC201, 202)

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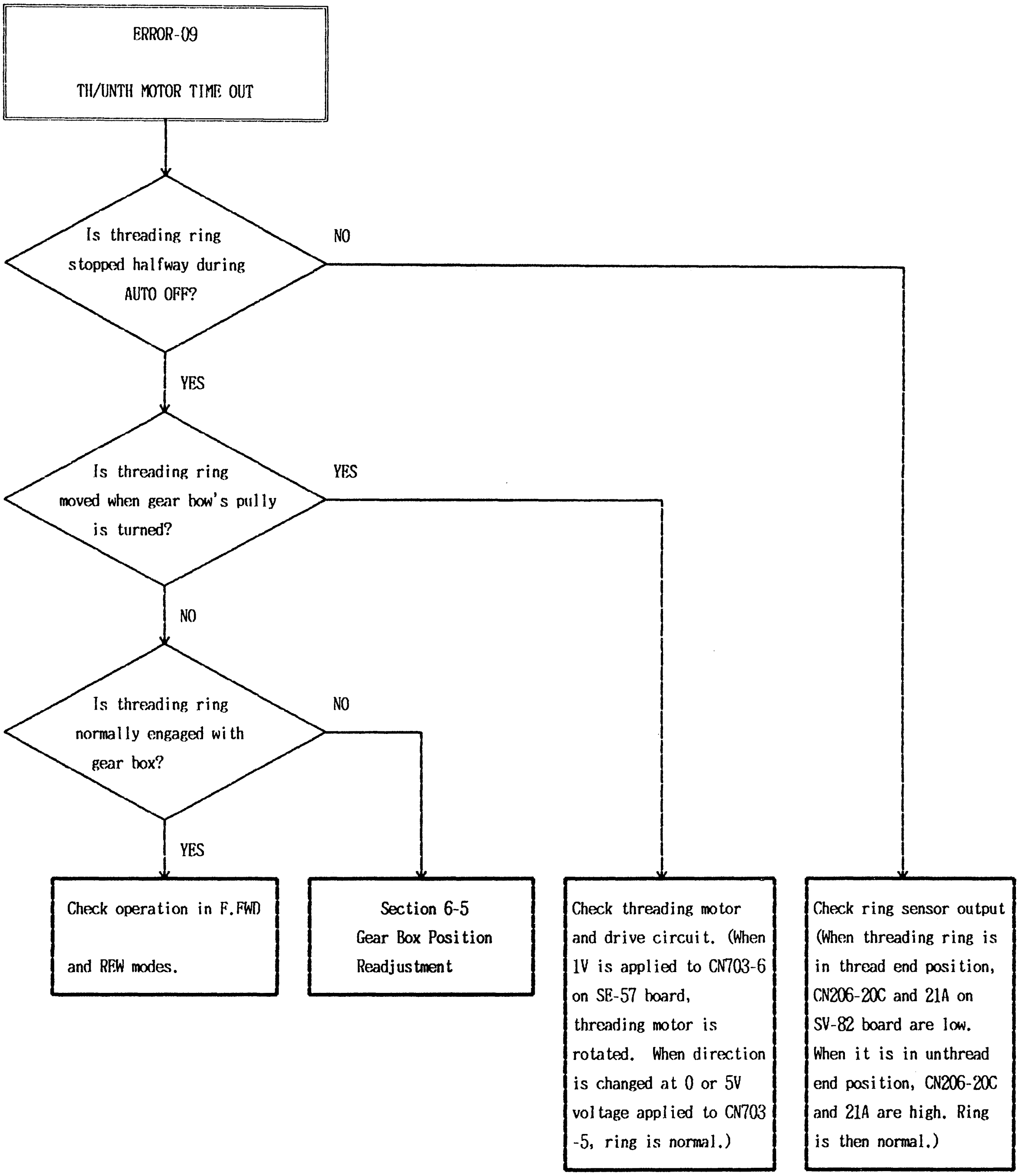
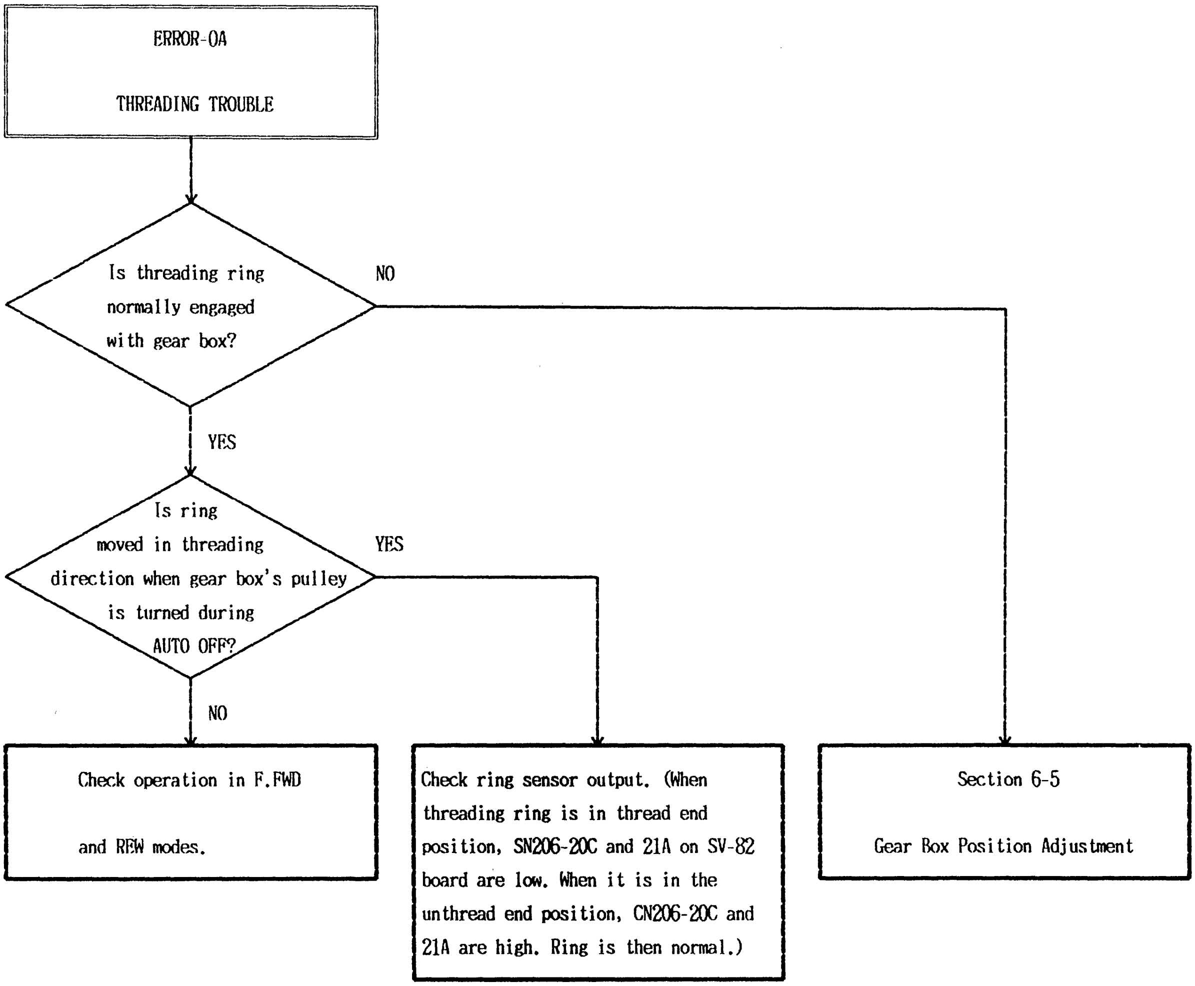
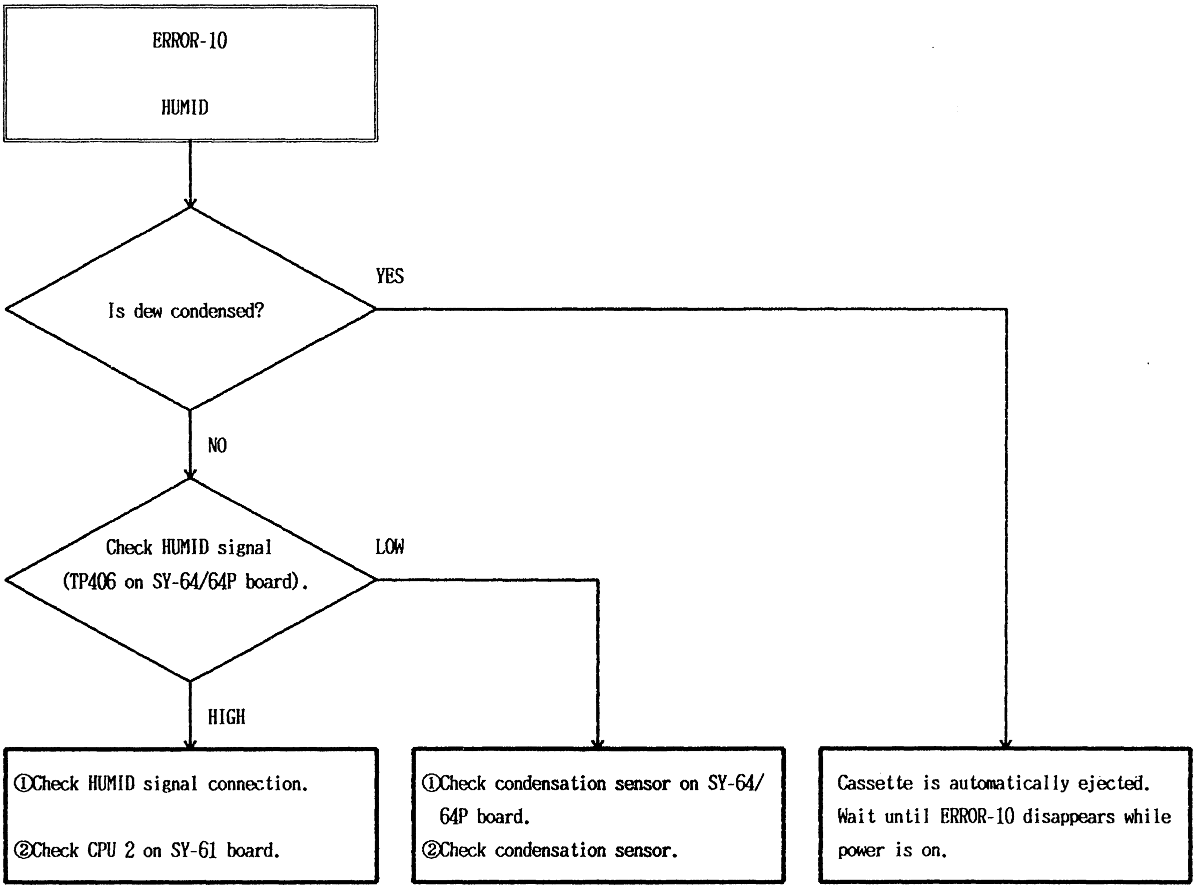
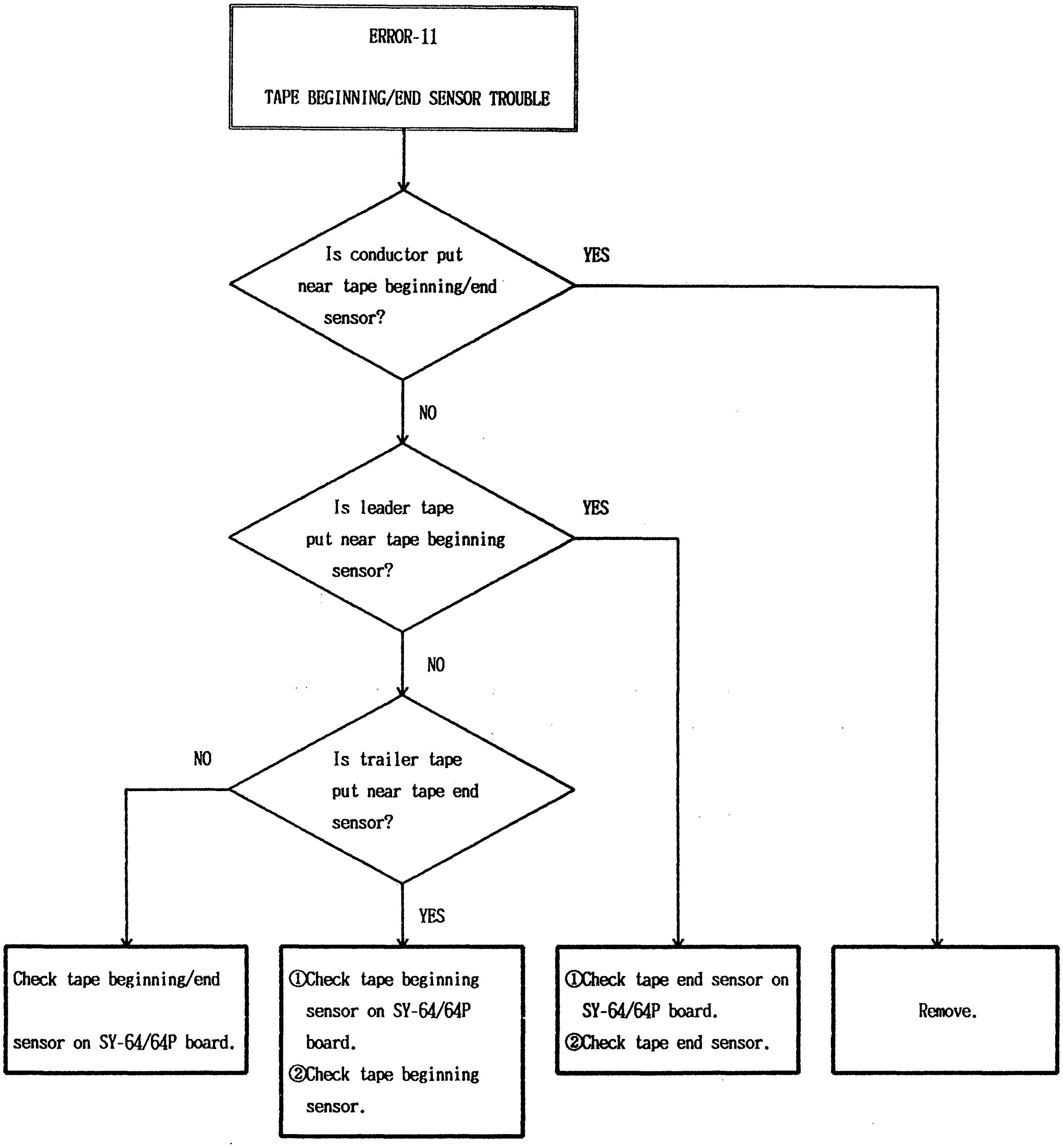
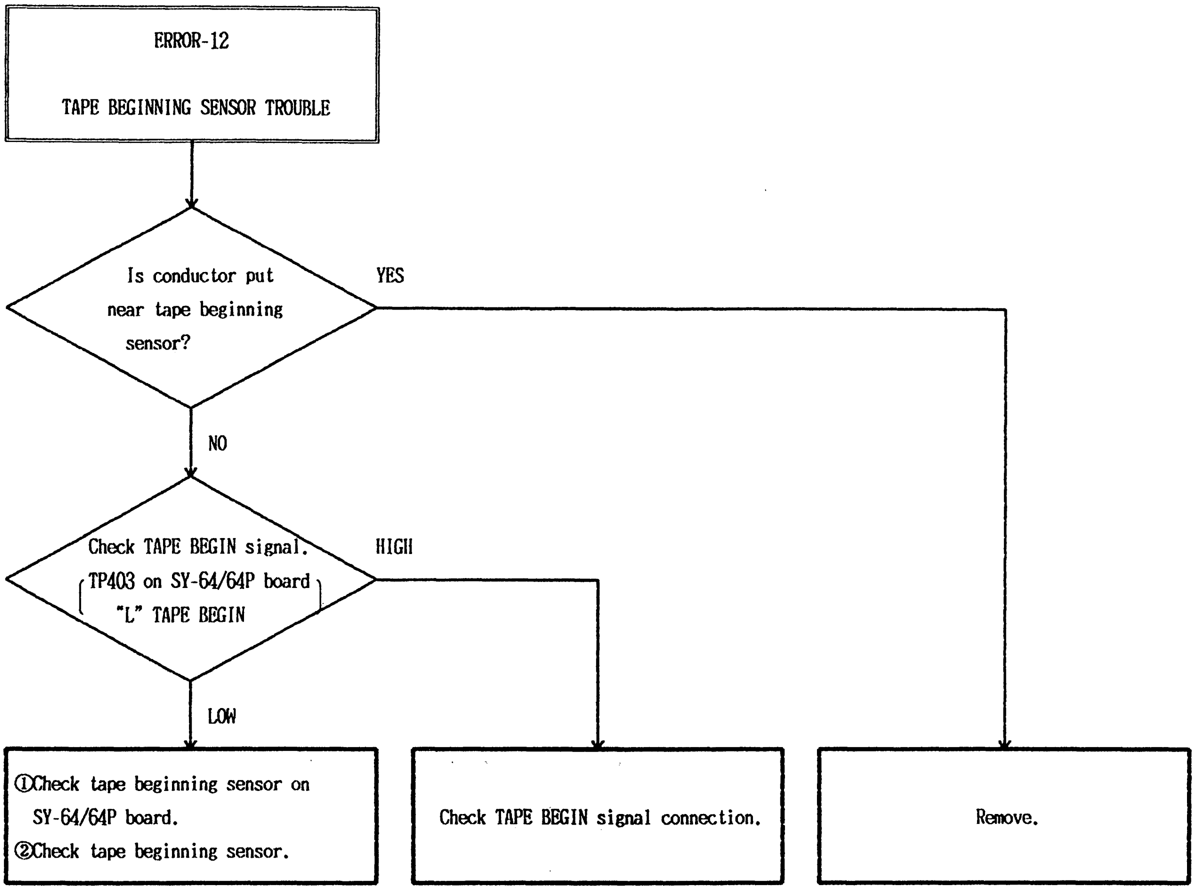
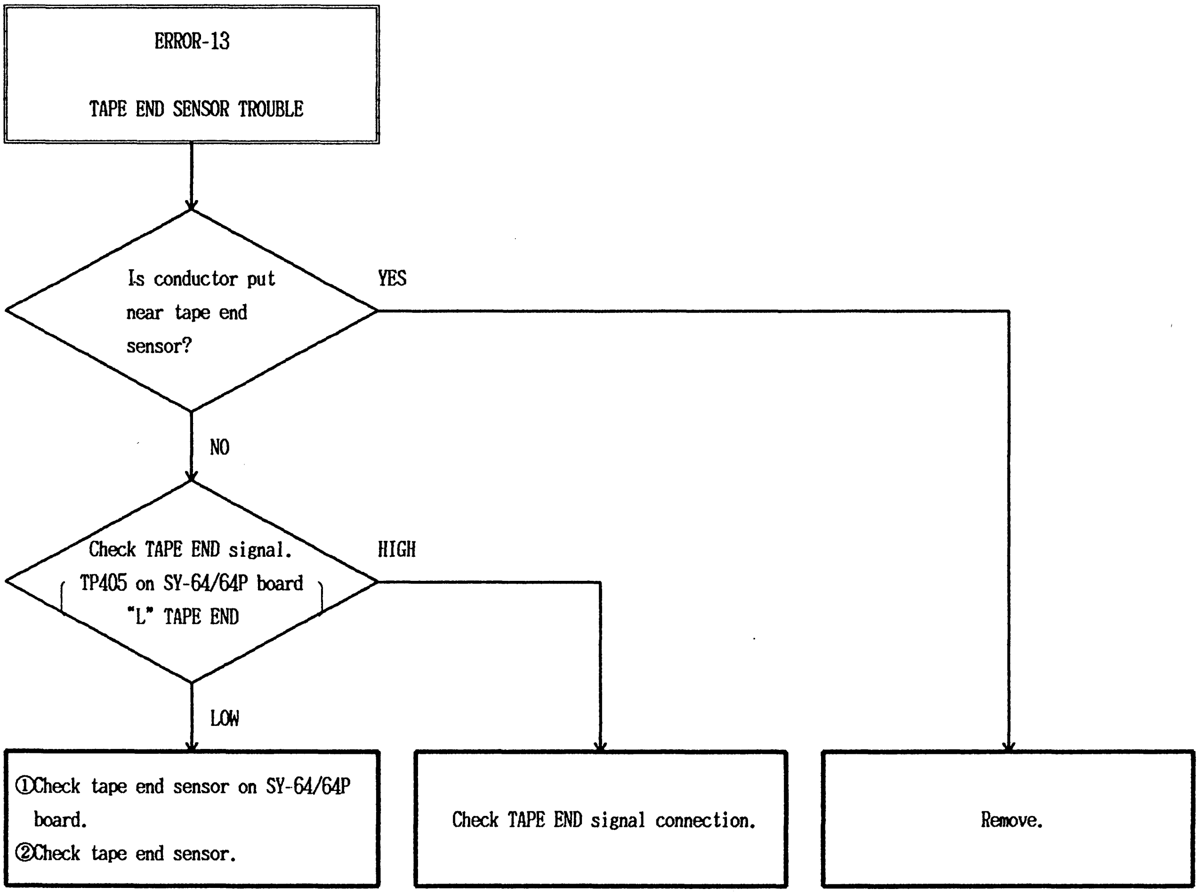

ERROR-09
TH/UNTH MOTOR TIME OUT
Is threading ring stopped halfway during AUTO OFF?
NO
YES
Is threading ring moved when gear box's pully is turned?
YES
NO
Is threading ring normally engaged with gear box?
NO
YES
Check operation in F.FWD and REW modes.
Section 6-5 Gear Box Position Readjustment
Check threading motor and drive circuit. (When 1V is applied to CN703-6 on SE-57 board, threading motor is rotated. When direction is changed at 0 or 5V voltage applied to CN703-5, ring is normal.)
Check ring sensor output (When threading ring is in thread end position, CN206-20C and 21A on SV-82 board are low. When it is in unthread end position, CN206-20C and 21A are high. Ring is then normal.)

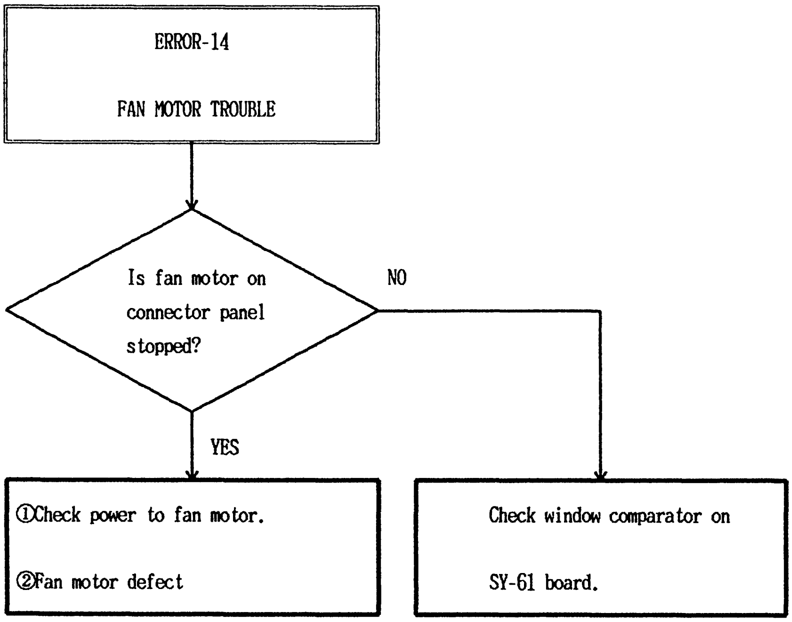

ERROR-0A
THREADING TROUBLE
Is threading ring normally engaged with gear box?
NO
YES
Is ring moved in threading direction when gear box's pulley is turned during AUTO OFF?
YES
NO
Check operation in F.FWD and REW modes.
Check ring sensor output. (When threading ring is in thread end position, SN206-20C and 21A on SV-82 board are low. When it is in the unthread end position, CN206-20C and 21A are high. Ring is then normal.)
Section 6-5
Gear Box Position Adjustment


ERROR-10
HUMID
Is dew condensed?
YES
NO
Check HUMID signal (TP406 on SY-64/64P board).
LOW
HIGH
①Check HUMID signal connection.
②Check CPU 2 on SY-61 board.
①Check condensation sensor on SY-64/64P board.
②Check condensation sensor.
Cassette is automatically ejected. Wait until ERROR-10 disappears while power is on.


ERROR-11
TAPE BEGINNING/END SENSOR TROUBLE
Is conductor put near tape beginning/end sensor?
YES
NO
Is leader tape put near tape beginning sensor?
YES
NO
Is trailer tape put near tape end sensor?
NO
YES
Check tape beginning/end sensor on SY-64/64P board.
①Check tape beginning sensor on SY-64/64P board.
②Check tape beginning sensor.
①Check tape end sensor on SY-64/64P board.
②Check tape end sensor.
Remove.


ERROR-12
TAPE BEGINNING SENSOR TROUBLE
Is conductor put near tape beginning sensor?
YES
NO
Check TAPE BEGIN signal.
TP403 on SY-64/64P board
"L" TAPE BEGIN
HIGH
LOW
①Check tape beginning sensor on SY-64/64P board.
②Check tape beginning sensor.
Check TAPE BEGIN signal connection.
Remove.

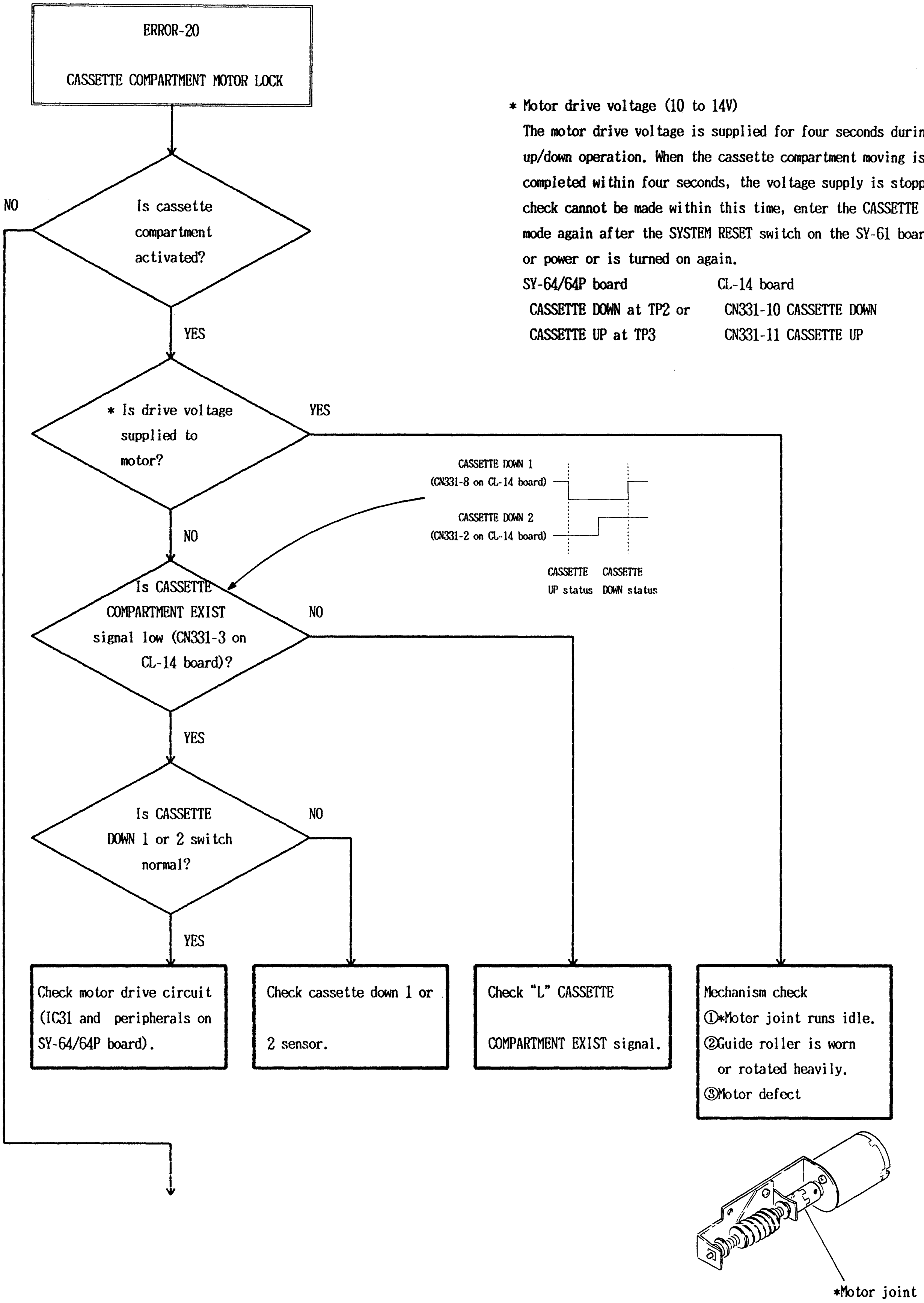

ERROR-13
TAPE END SENSOR TROUBLE
Is conductor put near tape end sensor?
YES
NO
Check TAPE END signal.
(TP405 on SY-64/64P board
"L" TAPE END)
HIGH
LOW
①Check tape end sensor on SY-64/64P board.
②Check tape end sensor.
Check TAPE END signal connection.
Remove.

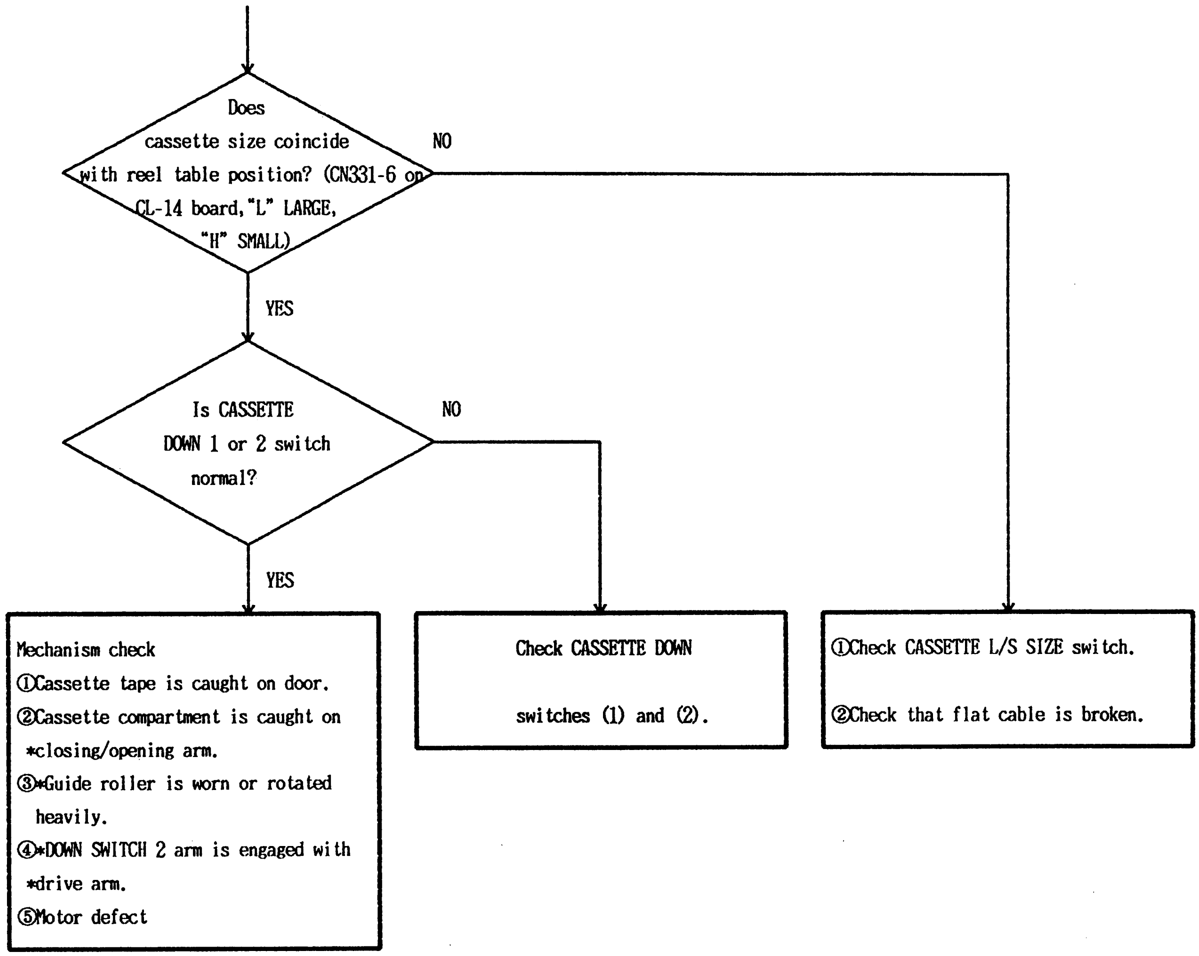

ERROR-14
FAN MOTOR TROUBLE
Is fan motor on connector panel stopped?
NO
YES
①Check power to fan motor.
②Fan motor defect
Check window comparator on SY-61 board.

* Motor drive voltage (10 to 14V)

The motor drive voltage is supplied for four seconds during cassette up/down operation. When the cassette compartment moving is not completed within four seconds, the voltage supply is stopped. When check cannot be made within this time, enter the CASSETTE UP/DOWN mode again after the SYSTEM RESET switch on the SY-61 board is pressed or power or is turned on again.

SY-64/64P board	CL-14 board
CASSETTE DOWN at TP2 or	CN331-10 CASSETTE DOWN
CASSETTE UP at TP3	CN331-11 CASSETTE UP


ERROR-20
CASSETTE COMPARTMENT MOTOR LOCK
Is cassette compartment activated?
NO
YES
* Is drive voltage supplied to motor?
YES
NO
Is CASSETTE COMPARTMENT EXIST signal low (CN331-3 on CL-14 board)?
NO
YES
Is CASSETTE DOWN 1 or 2 switch normal?
NO
YES
CASSETTE DOWN 1
(CN331-8 on CL-14 board)
CASSETTE DOWN 2
(CN331-2 on CL-14 board)
CASSETTE UP status
CASSETTE DOWN status
Check motor drive circuit (IC31 and peripherals on SY-64/64P board).
Check cassette down 1 or 2 sensor.
Check "L" CASSETTE COMPARTMENT EXIST signal.
Mechanism check
①*Motor joint runs idle.
②Guide roller is worn or rotated heavily.
③Motor defect
*Motor joint



Does cassette size coincide with reel table position? (CN331-6 on CL-14 board, "L" LARGE, "H" SMALL)

NO
YES

Is CASSETTE DOWN 1 or 2 switch normal?

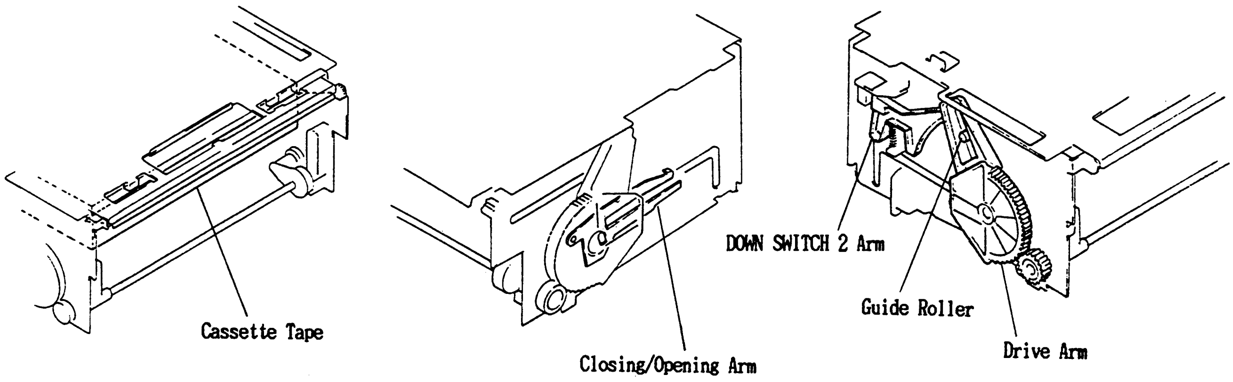
NO
YES

Mechanism check
①Cassette tape is caught on door.
②Cassette compartment is caught on *closing/opening arm.
③*Guide roller is worn or rotated heavily.
④*DOWN SWITCH 2 arm is engaged with *drive arm.
⑤Motor defect

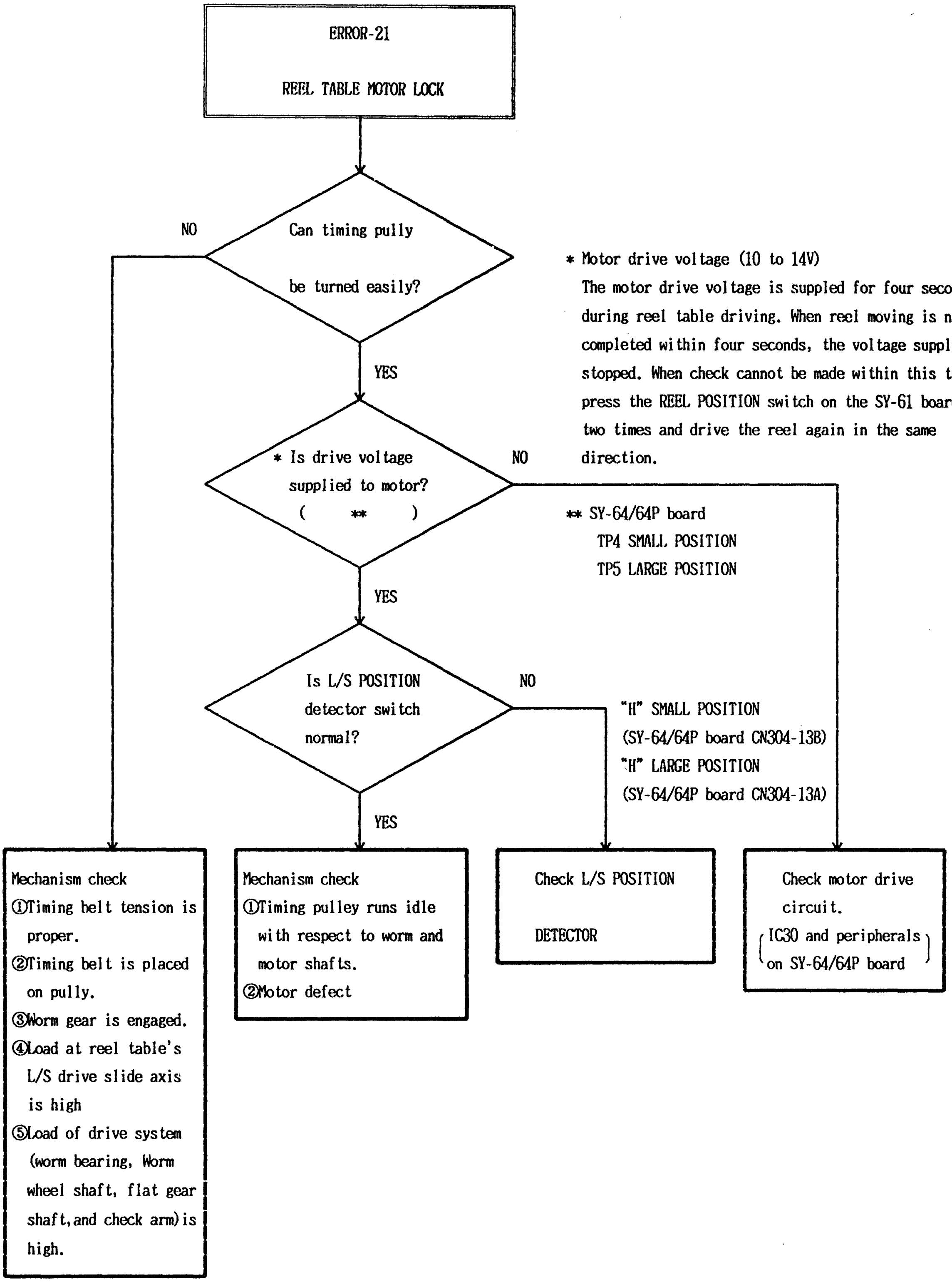
Check CASSETTE DOWN switches (1) and (2).

①Check CASSETTE L/S SIZE switch.
②Check that flat cable is broken.

*


Cassette Tape
Closing/Opening Arm
DOWN SWITCH 2 Arm
Guide Roller
Drive Arm

- When this error occurs, remove and check the cassette compartment.
- When the cassette compartment is removed, the EJECT button is pressed, and the REEL POSITION switch on the SY-61 board is pressed in UNTHREAD END mode, the reel position can be selected at random.


ERROR-21
REEL TABLE MOTOR LOCK
Can timing pully be turned easily?
NO
YES
* Is drive voltage supplied to motor? (**)
NO
YES
Is L/S POSITION detector switch normal?
NO
YES
Mechanism check
①Timing belt tension is proper.
②Timing belt is placed on pully.
③Worm gear is engaged.
④Load at reel table's L/S drive slide axis is high
⑤Load of drive system (worm bearing, Worm wheel shaft, flat gear shaft, and check arm) is high.
Mechanism check
①Timing pulley runs idle with respect to worm and motor shafts.
②Motor defect
Check L/S POSITION DETECTOR
Check motor drive circuit.
(IC30 and peripherals on SY-64/64P board)

* Motor drive voltage (10 to 14V)
The motor drive voltage is suppled for four seconds during reel table driving. When reel moving is not completed within four seconds, the voltage supply is stopped. When check cannot be made within this time, press the REEL POSITION switch on the SY-61 board two times and drive the reel again in the same direction.

** SY-64/64P board
TP4 SMALL POSITION
TP5 LARGE POSITION

"H" SMALL POSITION
(SY-64/64P board CN304-13B)
"H" LARGE POSITION
(SY-64/64P board CN304-13A)

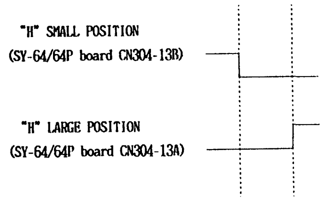
ERROR-22

REEL TABLE SENSOR TROUBLE

↓

Check reel table's

L/S POSITION sensor.


"H" SMALL POSITION
(SY-64/64P board CN304-13B)
"H" LARGE POSITION
(SY-64/64P board CN304-13A)

ERROR-23

THREADING RING POSITION ERROR

↓

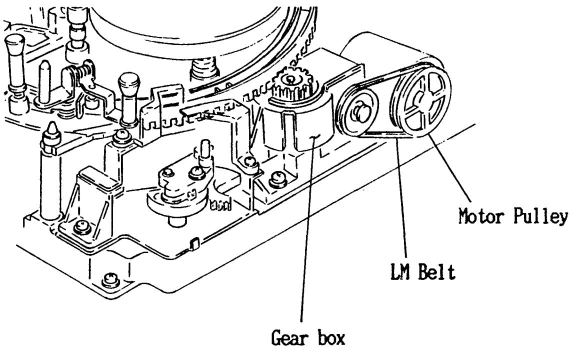
Mechanism check

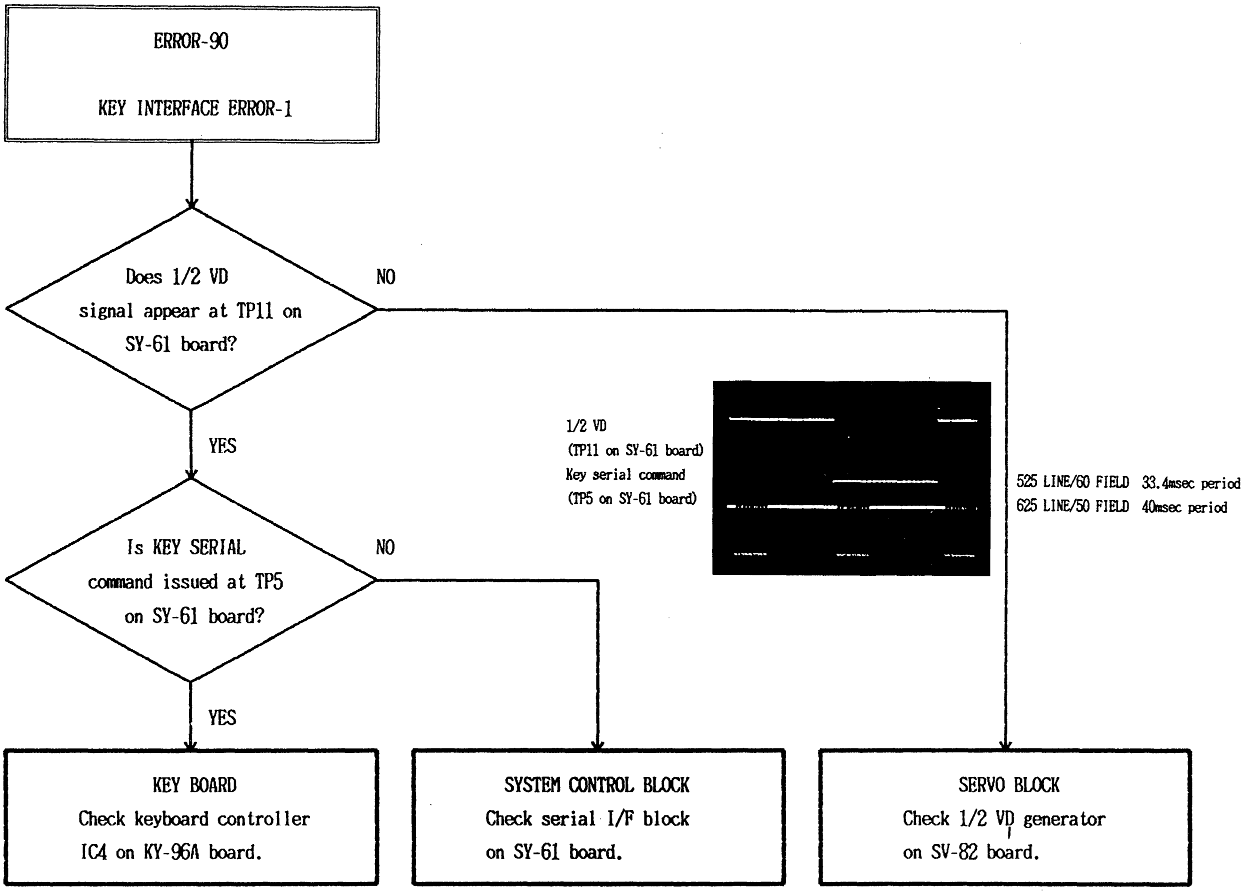
①*Gear box assembly's motor pulley is turned easily.

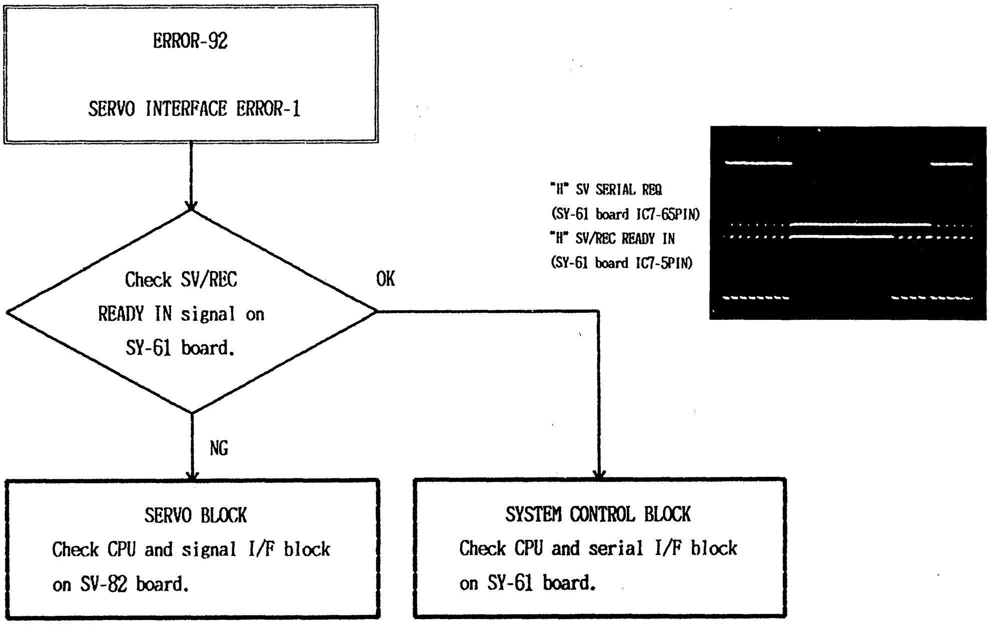
②Gear box position adjustment (6-5) is normal.

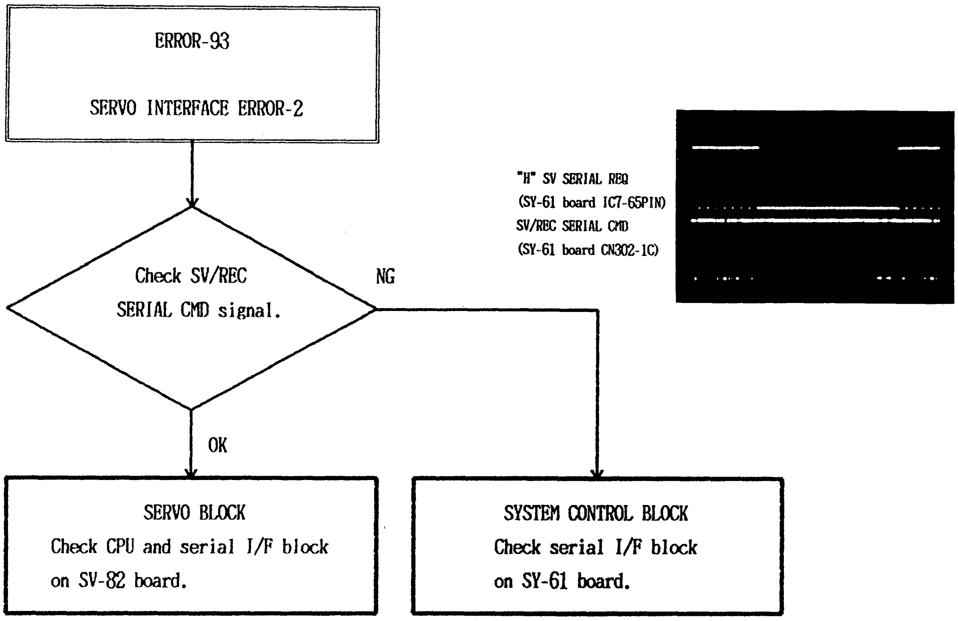
③Slip occurs in LM belt.

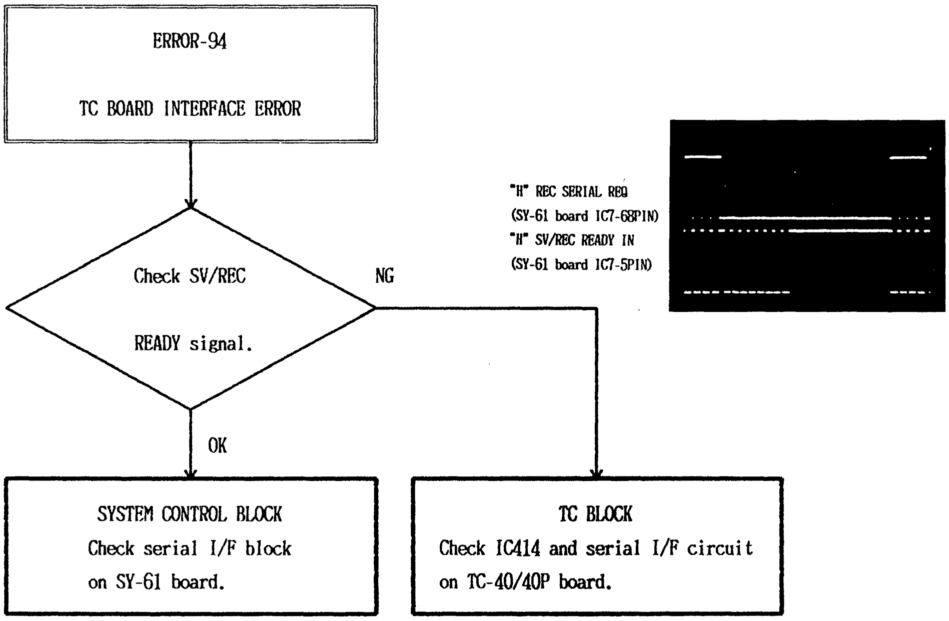
*

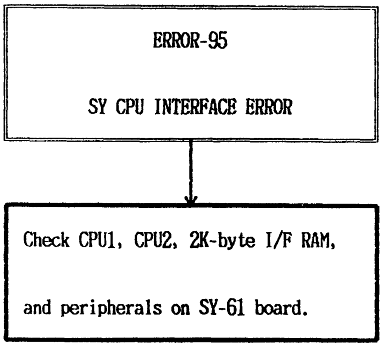

Motor Pulley
LM Belt
Gear box

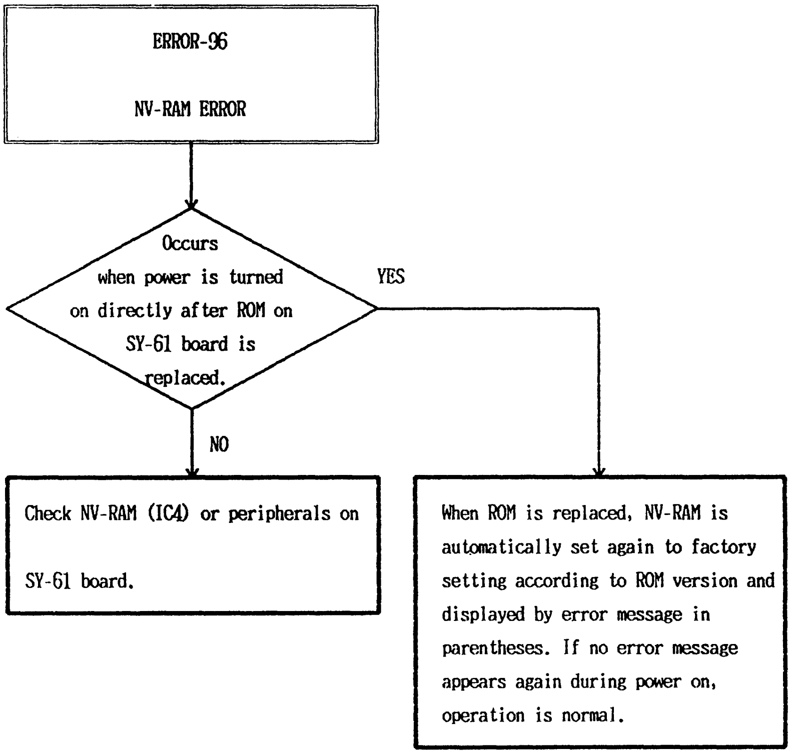

ERROR-90
KEY INTERFACE ERROR-1
Does 1/2 VD signal appear at TP11 on SY-61 board?
NO
YES
Is KEY SERIAL command issued at TP5 on SY-61 board?
NO
YES
1/2 VD
(TP11 on SY-61 board)
Key serial command
(TP5 on SY-61 board)
525 LINE/60 FIELD 33.4msec period
625 LINE/50 FIELD 40msec period
KEY BOARD
Check keyboard controller
IC4 on KY-96A board.
SYSTEM CONTROL BLOCK
Check serial I/F block
on SY-61 board.
SERVO BLOCK
Check 1/2 VD generator
on SV-82 board.


ERROR-92
SERVO INTERFACE ERROR-1
Check SV/REC READY IN signal on SY-61 board.
OK
NG
"H" SV SERIAL REQ
(SY-61 board IC7-65PIN)
"H" SV/REC READY IN
(SY-61 board IC7-5PIN)
SERVO BLOCK
Check CPU and signal I/F block
on SV-82 board.
SYSTEM CONTROL BLOCK
Check CPU and serial I/F block
on SY-61 board.


ERROR-93
SERVO INTERFACE ERROR-2
Check SV/REC SERIAL CMD signal.
NG
OK
SERVO BLOCK
Check CPU and serial I/F block on SV-82 board.
SYSTEM CONTROL BLOCK
Check serial I/F block on SY-61 board.
"H" SV SERIAL REQ
(SY-61 board IC7-65PIN)
SV/REC SERIAL CMD
(SY-61 board CN302-1C)


ERROR-94
TC BOARD INTERFACE ERROR
Check SV/REC READY signal.
NG
OK
SYSTEM CONTROL BLOCK
Check serial I/F block on SY-61 board.
TC BLOCK
Check IC414 and serial I/F circuit on TC-40/40P board.
"H" REC SERIAL REQ
(SY-61 board IC7-68PIN)
"H" SV/REC READY IN
(SY-61 board IC7-5PIN)


ERROR-95
SY CPU INTERFACE ERROR
Check CPU1, CPU2, 2K-byte I/F RAM, and peripherals on SY-61 board.


ERROR-96
NV-RAM ERROR
Occurs when power is turned on directly after ROM on SY-61 board is replaced.
YES
NO
Check NV-RAM (IC4) or peripherals on SY-61 board.
When ROM is replaced, NV-RAM is automatically set again to factory setting according to ROM version and displayed by error message in parentheses. If no error message appears again during power on, operation is normal.

SECTION 3
PERIODIC CHECK AND MAINTENANCE

3-1. SYSTEM CONTROL OPERATION CHECK

3-1-1. Playback, F.FWD, REW, SHUTTLE, JOG, and Preroll Function Checks

The following should be checked daily before operation.
The check procedure described here is primarily for the BVW-70P but can also be applied to operating the remote control unit.
Note that the switches must be set according to how the machine is used after the checks.

- Thread a recorded tape (Video, Audio CH-1/CH-2/CH-3/CH-4). (Do not use an alignment tape.)
- Connect a video/audio monitor.
- Internal switch setting: The following are the procedures when Item 101 is set to DATA No. 1 in the system setup. When it is set to DATA No. 0, the procedure indicated within the double line need not be performed.
  (Refer to Sec. 1-7 for further details.)
- Select switch setting; POWER : ON
  REMOTE/LOCAL : LOCAL
  PB.PB/EE : PB
  AUDIO MONITOR : ST/MIX
  MONITOR : LNG
  CTL/TC/U-BIT : CTL
  TRACKING : FIX
  SHUTTLE/JOG : SHUTTLE

Action	Check that
Insert the cassette	
Press F.FWD	A playback picture appears in the F.FWD mode.
Press STOP	A still picture appears.
Press PLAY	A playback picture appears (video/audio CH-1 and audio CH-2 are present). The meter reading is increased when the AUDIO PB volume control is turned clockwise. The playback volume is increased when the HEADPHONES control is turned clockwise with the headphones connected to the HEADPHONES jack.

Set MONITOR switch to FM	A playback picture appears (audio CH-3 and CH-4 are present). The meter reading is increased when the AUDIO PB volume control is turned clockwise. The playback volume is increased when the HEADPHONES control is turned clockwise with the headphones connected to the HEADPHONES jack.
Press SHUTTLE/JOG	
Turn the search dial gradually to the right	A forward playback picture appears in the SHUTTLE mode. The playback speed increases when the dial is turned clockwise.
Turn the search dial fully to the right (until it clicks)	A forward playback picture (x 24) appears in the SHUTTLE mode (video/audio playback check). (When system setup Item 102 is set to DATA No. 2, the tape runs at 24 times normal speed. When it is set to DATA No. 0, the tape runs at 42 times normal speed.)
Return the dial to the center position	A still picture appears in the SHUTTLE mode.
Turn the search dial gradually to the left	A reverse playback picture appears in the SHUTTLE mode (the playback speed increases when the dial is turned counterclockwise).
Turn the search dial fully to the left (until it clicks)	A reverse playback picture (x 24) appears in the SHUTTLE mode (video/audio playback check). (When system setup Item 102 is set to DATA No. 2, the tape runs at 24 times normal speed. When it is set to DATA No. 0, the tape runs at 42 times normal speed.)
Press the search dial	A still picture appears in the JOG mode.
Press time counter's RESET	(The counter reading becomes zero.)
Set CTL/TC/U-BIT select switch to TC	The counter display is set to the TC mode.
Press ENTRY and IN simultaneously	PREROLL IN point is memorized. The displayed counter value is then memorized.
Turn the search dial manually to the right	A forward playback picture appears in the JOG mode (the tape runs in the forward direction in accordance with the dial's rotation speed).

Turn the search dial manually to the left	A reverse playback picture appears in the JOG mode (the tape runs in the reverse direction in accordance with the dial's rotation speed).
Press PREROLL	The tape automatically stops prior to the time (i.e., IN point) selected by system setup Item 001.
Press STANDBY	The STANDBY lamp goes off. Only noise appears on the monitor.
Set PB.PB/EE select switch to PB/EE	
Press F.FWD	The E-to-E mode picture appears on the monitor only when system setup Item 108 is set to DATA No. 0.
Press REW	The tape rewinds (the E-to-E mode picture appears on the monitor only when system setup Item 108 is set to DATA No. 0). The tape stops automatically at the beginning of the tape.
Press EJECT	The cassette is ejected.

3-1-2. Record Function Check

The following should be checked daily before operation when the BVW-70P is used as a recorder only.
The check procedure described here is primarily for the BVW-70P but can also be applied to operating the remote control unit.
Note that the switches must be set according to how the machine is used after the checks.

- Insert a video cassette tape on which recording and playback can be made.
- Connect signals to the VIDEO IN/AUDIO IN CH-1 and AUDIO IN CH-2, CH-3, and CH-4 connectors.
- Set the INPUT SELECT switch to COMPOSITE.
- Connect a video/audio monitor.
- Select switch setting;
  POWER : ON
  REMOTE/LOCAL : LOCAL
  INPUT SELECT : COMPOSITE
  PB.PB/EE : PB

Action	**Check that**
Insert the cassette	
Press REC and PLAY simultaneously	The recording begins.
Press REW.	The tape rewinds (the tape is rewound up to the beginning of recording).
Press PLAY	The recorded scene is played back (video/audio CH-1 and audio CH-2, CH-3, and CH-4 are present).
Press REC and hold it down during playback	The E-to-E mode picture appears while REC is pressed; the playback picture appears when it is released.
Press INSERTs (VIDEO/AUDIO CH-1 and CH-2).	The VIDEO/AUDIO CH-1 and AUDIO CH-2 lamps light.

Press PLAY and EDIT simultaneously	The manual edit recording will begin.
Press PLAY	The manual edit recording will stop, but the tape will continue to run in the playback mode.
Press STOP	A still picture appears.
Press EDIT	The E-to-E mode picture appears.
Press STOP	The E-to-E mode picture disappears and the still picture appears.
Set PB.PB/EE select switch to PB/EE	
Press REW	The tape rewinds (the tape is rewound up to the beginning of edit-recording. The E-to-E mode picture appears on the monitor only when system setup Item 108 is set to DATA No. 0).
Press PLAY	The manually edit-recorded video is played back (video/audio CH-1 and audio CH-2 are present).
Press F.FWD	The tape advances rapidly (the tape is advanced up to the beginning of edit-recording. The E-to-E mode picture appears on the monitor only when system setup Item 108 is set to DATA No. 0).
Press EJECT	The cassette is ejected.

3-1-3. Editing Function Check

The following (including Sec. 3-1-1) should be checked daily before operation when the BVW-70P is used as an editing machine.
The check procedure described here is primarily for the BVW-70P but can also be applied to operating the remote control unit.
Note that the switches must be set according to how the machine is used after the checks.

- Thread a recorded tape (Video, Audio CH-1, CH-2, CH-3, and CH-4). (Do not use an alignment tape.)
- Connect signals to the VIDEO IN/AUDIO IN CH-1, CH-2, CH-3, and CH-4 connectors (use signals that differ from those recorded on the tape).
- Set the INPUT SELECT switch to COMPOSITE.
- Internal switch setting: The following are the procedures when Item 101 is set to DATA No. 1 in the system setup.
  (Refer to Sec. 1-7 for further details.)
- Select switch setting;
  POWER : ON
  REMOTE/LOCAL : LOCAL
  PB.PB/EE : PB
  INPUT SELECT : COMPOSITE

Action	**Check that**
Insert the cassette ↓	
Press INSERTs (VIDEO, AUDIO CH-1 and AUDIO CH-2) ↓	
Press PLAY ↓	
Press STOP ↓	
Press ENTRY and IN simultaneously ↓	. . The IN-point is determined and memorized. Note the counter number of the point (EDIT-IN).
Turn the search dial to the right ↓	The OUT-point is searched.
Return the dial to the center position ↓	
Press ENTRY and OUT simultaneously ↓	. . The OUT-point is determined and memorized. Note the counter number of the point (EDIT-OUT).

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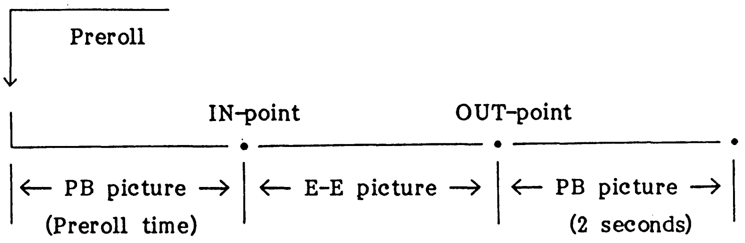
Press PREVIEW . . . . The tape is prerolled and the previewed picture appears.



While pressing IN, press TRIM (-) ten times . . . The IN-point is modified.
(The IN-point position is displayed on the counter, and the counter is decremented by one frame every time TRIM (-) is pressed.

While pressing OUT, press TRIM (+) ten times . . The OUT-point is modified.
(The OUT-point position is displayed on the counter, and the counter is incremented by one frame every time TRIM (+) is pressed.)

Press AUTO EDIT . . . . Edit recording proceeds in the INSERT mode.

Press REVIEW . . . . The edited and recorded area is reviewed.
(The tape runs as in the REVIEW and PREVIEW modes established by editing at the modified IN-and OUT-points. After being reviewed, the tape is returned to the OUT-point.)

Press ASSEMBLE

Press AUTO EDIT . . . . Edit recording proceeds in the ASSEMBLE mode.

Press ENTRY and OUT simultaneously . . Auto edit recording stops.
(Edit recording stops in the ASSEMBLE mode.)

Press REVIEW . . . . The edited and recorded area is reviewed in the ASSEMBLE mode (video/audio CH-1, CH-2, CH-3, and CH-4 are present).

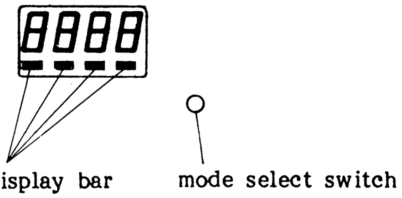
Press REW

Press EJECT after AUTO STOP

3-2. DIGITAL HOURS METER

3-2-1. Outline

When you open the Function Control Panel, a digital hours meter can be seen on the left of the chassis. The hours meter has four display modes. The accumulated elapsed operation time or the number of operations is displayed for every mode. It is recommended to perform the periodic checks and maintenance based on the hours meter.



Note: The hours meter, which has a built-in battery, should be replaced every 3 years.

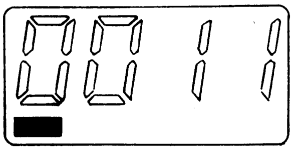
3-2-2. Description of the Display Mode

1. T1: OPERATION METER mode
   - Displays accumulated time that the power of the unit has been turned on.
2. T2: DRUM RUNNING METER mode
   - Displays accumulated rotation time of the drum in the THREADING END mode.
3. T3: TAPE RUNNING METER mode
   - Displays accumulated tape running time in the F.FWD REW, PLAY, SEARCH, REC, and EDIT modes (not including the STILL mode).
4. CT: THREADING/UNTHREADING COUNTER mode
   - Displays accumulated number of threading and unthreading operations.

. T1, T2, and T3

These modes display the accumulated time. The actual operation time is equal to the displayed value multiplied by 10.

Example

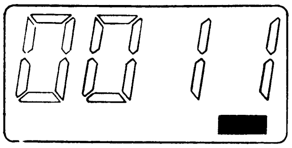


This display indicates between 110 hours 00 minutes 00 seconds and 119 hours 59 minutes 59 seconds (up to a maximum of 99,999 hours 59 minutes 59 seconds can be displayed).

. CT

This mode displays the number of operations instead of the hours. The actual operation number is equal to the displayed value multiplied by 10.

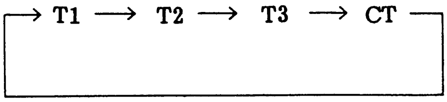
Example



This display indicates between 110 and 119 operations.

3-2-3. Mode Selection

When the mode select switch is pressed, the display rotates in the sequence shown below.



When the mode is set, the mode display bar in the designated mode lights or blinks. The VTR operation status at that time is described below.

Mode	Lights	Blinks
T1	. VTR power is off.	. VTR power is on.
T2	. VTR power is off. . VTR power is on in a mode other than THREADING END.	. Drum is rotating in the THREADING END mode.
T3	. VTR power is off. . VTR power is on in a mode other than F.FWD, REW, PLAY, SEARCH, REC, or EDIT.	. Tape is running in the F.FWD, REW, PLAY, SEARCH, REC, or EDIT mode.
CT		. Every time if VTR power is on or off.

3-3. MAINTENANCE AFTER REPAIRS

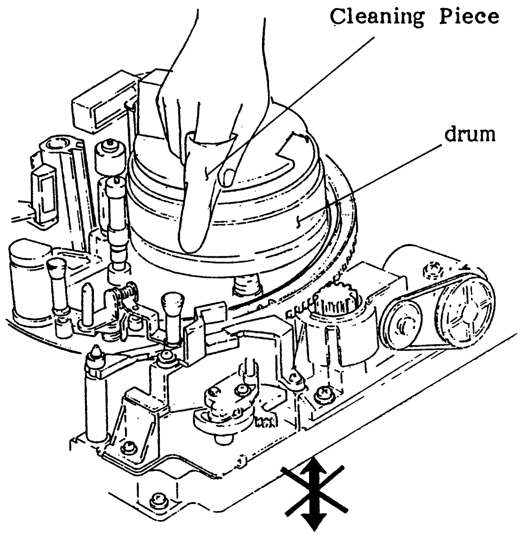
Perform the following maintenance after repairs regardless of the unit operating hours:

1. Video heads and stationary heads cleaning. (Refer to Sections 3-3-1 and 3-3-2.)
2. Tape movement area cleaning. (Refer to Section 3-3-3.)

NOTE: Wait until the cleaning fluid evaporates completely before inserting a cassette tape.

3-3-1. Cleaning Procedure of the Video Head

Press a cleaning piece moistened with cleaning fluid and turn the drum slowly with hand.



Never move the cleaning piece vertically.

NOTE: Never move the cleaning piece in the vertical direction of the head tip.
. Clean the head with the power off.

Never move the cleaning piece vertically.

3-3-2. Cleaning Procedure of the Stationary Heads

Clean with a cleaning cloth moistened with cleaning fluid.

3-3-3. Cleaning Procedure of the Tape Movement Areas

Wipe the tape bearing surfaces (of the tape guides, drum, capstan and pinch roller) with a cleaning piece moistened with cleaning fluid.

NOTE: Do not clean the surface of the condensation sensor on the lower drum with the moistened cleaning piece; clean it with a dry cloth.

3-4-1. PERIODIC CHECK

To obtain the higher function and performance of the unit or the longer lives of the unit and tape, perform the periodic checks below according to the hours meter reading on the front panel.

Item	Part No.	Hours meter mode	Replacement	Remarks
Upper drum replacement	A-8260-445-A	T2	1,000 H	The video head life is greatly affected by operational conditions and tapes. Clean every 500 hours.
Cleaning roller replacement	X-3675-858-1	T2	1,000 H	
Brush replacement	A-6050-647-A	T2	3,000 H	
Slip ring replacement	A-6050-651-A	T2	3,000 H	
Pinch roller replacement	X-3717-215-3	T3	1,000 H	Clean every 500 hours.
Lower drum replacement	A-8260-640-A	T2	3,000 H	Clean the drum's tape transport surface every 500 hours.
TG1 tape guide replacement	A-6746-027-C	T3	3,000 H	
TG2 tape guide replacement	A-6746-028-C	T3	3,000 H	
TG3 tape guide replacement	A-6746-029-D	T3	3,000 H	
TG4 tape guide replacement	A-6746-030-C	T3	3,000 H	
Replacement of tape guide's upper and lower flanges on threading ring	3-717-267-01 3-680-812-00	T3	3,000 H	
Reel motor replacement	A-8319-163-A	T3	3,000 H	
Capstan motor replacement	8-835-259-03	T3	6,000 H	
AUDIO/TC head replacement	8-825-623-22	T3	3,000 H	Clean every 500 hours.
Audio confi head replacement	8-825-771-11	T3	3,000 H	Clean every 500 hours.
CTL head replacement	8-825-554-73	T3	3,000 H	Clean every 500 hours.
	8-825-554-74	—	———	Not replacement

Item	Part No.	Hours meter mode	Replacement	Remarks
Full Erase head replacement	8-825-770-73	T3	3,000 H	Clean every 500 hours.
Threading belt (LM belt) replacement	3-688-066-02	CT T2	100,000 times 4,000 H	Replace either of them.
Gear box replacement	A-6750-213-J	CT	200,000 times	Do not replace the threading motor only, but whole gear box.
T gear 1 assembly replacement	X-3717-250-2	CT	100,000 times	
Fan motor replacement	1-541-431-31	T1	10,000 H	
S/T brake solenoid replacement	1-454-417-41	CT	200,000 times	
Pinch solenoid replacement	1-454-338-00	CT	200,000 times	Used in LMS system.
	1-454-338-00	T3	3,000 H	Used in systems other than LMS.
Cassette-up compartment replacement	A-8269-966-A	CT	100,000 times	Do not replace the cassette-up compartment motor only, but whole cassette-up compartment.
Main brake replacement	A-6741-066-B	CT	200,000 times	
Ring roller replacement	3-675-866-00	CT	200,000 times	After ring roller replacement, perform the tape run adjustment and the tracking adjustment. Replacement during overhauling is recommended.
Hours meter replacement	1-548-152-11	Replace every 3 years.		The digital hours meter has an internal battery.

3-4-2. Periodic Cleaning

It is recommended to clean the tape path system every 50 hours and 200 hours in order to maintain stable performance for an extended period.

Required tools
Cleaning tape : BCT-5CLN or BCT-D12CL
Cleaning piece : 3-184-527-01
Cleaning fluid : 9-919-573-01

Every 50 hours : Cleaning using the cleaning tape

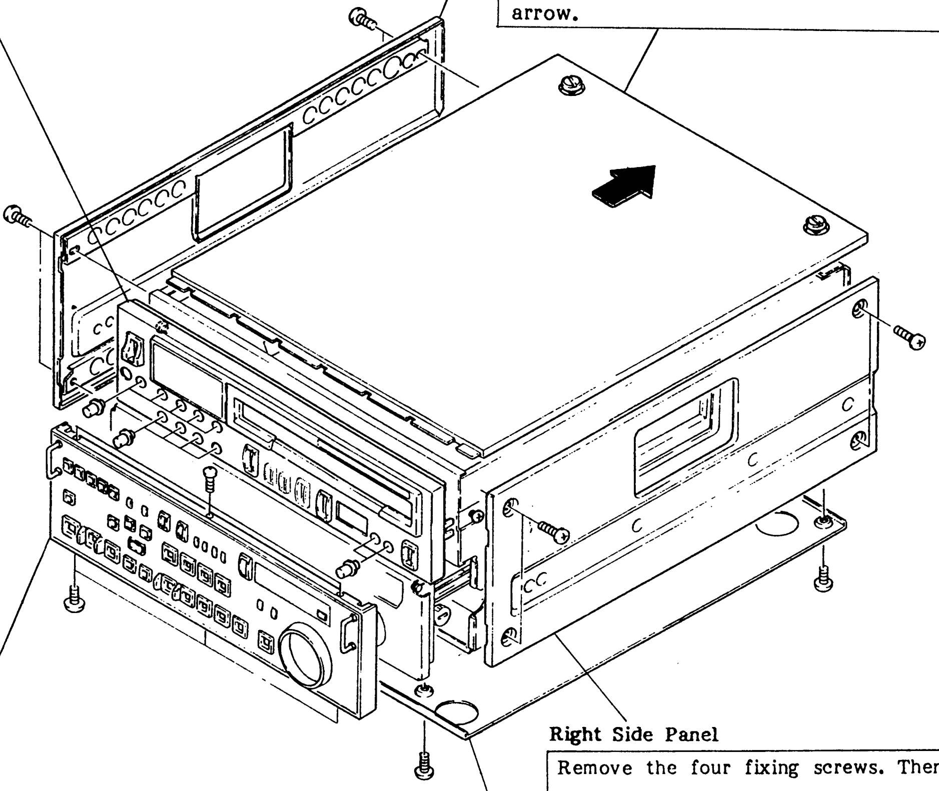
1. Insert the cleaning tape cassette.
2. Press the EJECT and PLAY buttons at the same time.
   The head cleaning starts.
3. The cleaning tape is automatically ejected after five seconds.

Every 200 hours : Cleaning using the cleaning tape and the cleaning piece

1. Insert the cleaning tape cassette.
2. Press the EJECT and PLAY buttons at the same time.
   The head cleaning starts.
3. The cleaning tape is automatically ejected after five seconds.
4. Wipe the head drum and the tape path system with the cleaning piece moistened with cleaning fluid.
   (Refer to sections 3-3-1, 3-3-2 and 3-3-3 for the cleaning procedure.)
5. Wipe the head drum and the tape path system with a clean dry cleaning piece.

SECTION 4
SERVICE INFORMATION

4-1. REMOVAL OF CABINET



Left Side Panel

Remove the four fixing screws. Then remove the Left Side Panel from the unit.

Control Panel

Remove the Upper Panel.
Remove the two fixing screws and washers.
Then remove the Control Panel from the unit.

Upper Panel

Remove the two fixing screws. Then remove the Upper Panel from the unit in the direction of the arrow.

Right Side Panel

Remove the four fixing screws. Then remove the Right Side Panel from the unit.

Function Control Panel

Pull the Function Control Panel forward.
Remove the search dial and the three fixing screws. Then remove the Function Control Panel from the unit.

Lower Panel

Remove the six fixing screws. Then remove the Lower Panel from the unit.

4-2. REMOVAL/INSTALLATION OF CASSETTE-UP COMPARTMENT

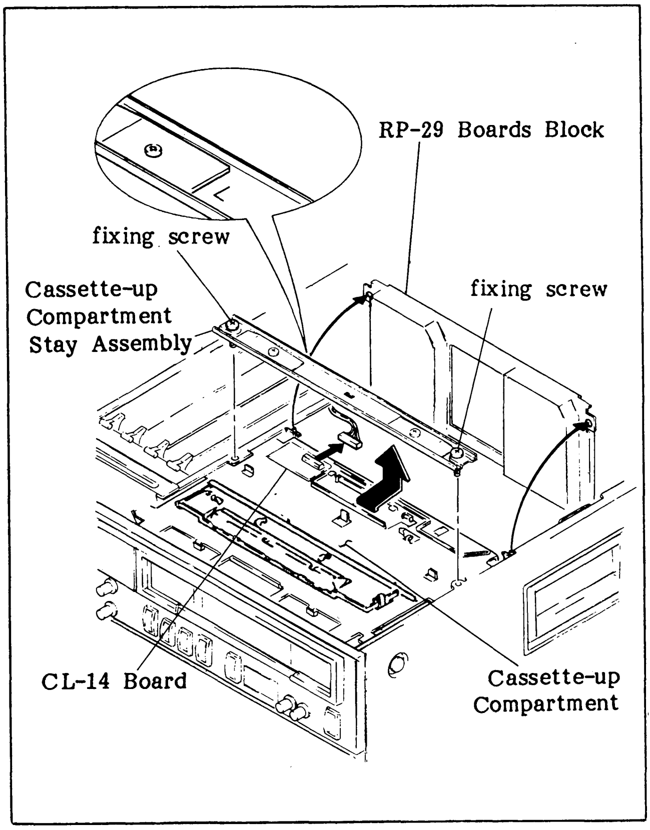
1. Remove the Upper Panel. (Refer to Section 4-1.)
2. Open the RP-29P Boards Block.

. Removal

3. Loosen the two fixing screws and remove the Cassette-up Compartment Stay. (This screw has a retainer.)
4. Disconnect connector CN331 on the CL-14 Board.
5. Move the Cassette-up Compartment in the direction as shown in the figure. Lift the Cassette-up Compartment Block slowly.

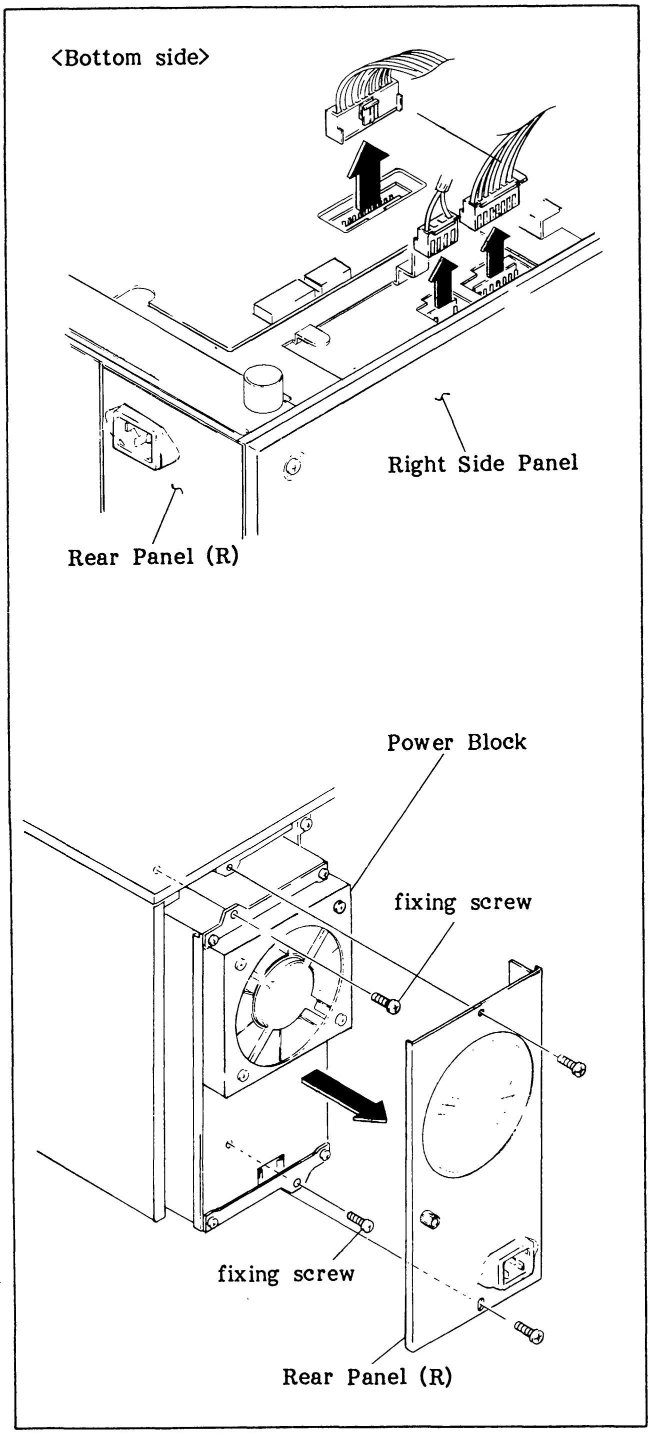
. Installation

6. Install the Cassette-up Compartment.
7. Make sure that the marked "L" on the Cassette-up Compartment Stay is on the left side; tighten the screw. And then tighten the screw on the right side.


RP-29 Boards Block
L
fixing screw
Cassette-up Compartment Stay Assembly
fixing screw
CL-14 Board
Cassette-up Compartment

4-3. REMOVAL OF THE POWER BLOCK

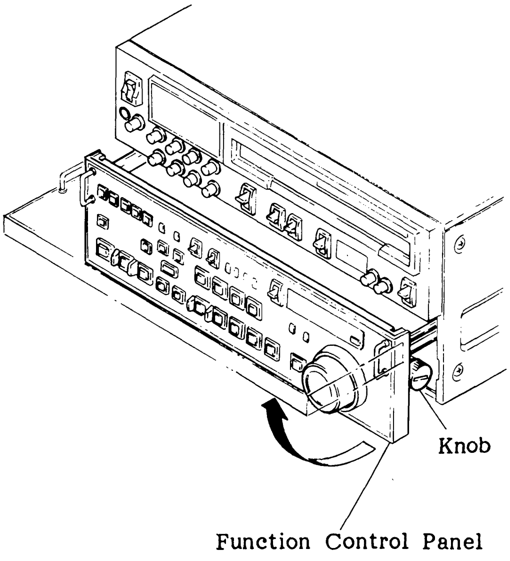
1. Remove the Lower Panel.
2. Remove the Shield Plate of the MB-191A Board.
3. Disconnect the connectors as shown in the figure.
4. Remove the Rear Panel (R).
5. Remove the two fixing screws as shown in the figure and remove the Power Block.


<Bottom side>
Right Side Panel
Rear Panel (R)
Power Block
fixing screw
fixing screw
Rear Panel (R)

4-4. HOW TO PULL IN/OUT THE FUNCTION CONTROL PANEL

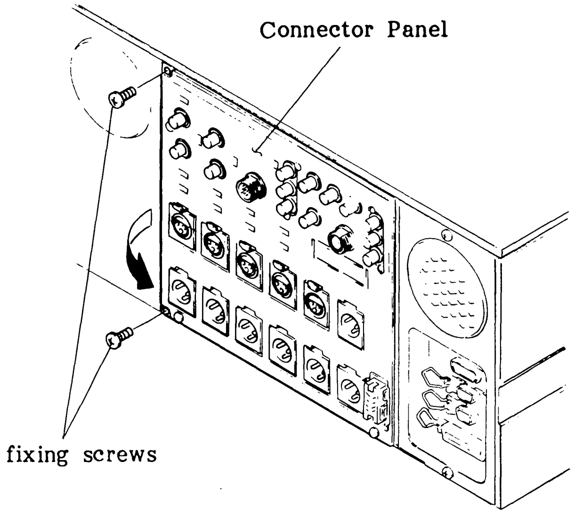
1. Pull the Function Control Panel on both right and left sides forward. Move the panel forward.
2. Pull it more forward to fix the panel. Lift the Function Control Panel. The panel moves maximum 90 degrees (the fixed position is selectable by five steps).
3. When putting the panel back in the unit, replace the panel and it into the unit.

NOTE: After using the panel, be sure to put it back into the unit.



4-5. HOW TO OPEN THE CONNECTOR PANEL

Remove the two fixing screws shown in the figure, then open the Connector Panel in the direction of the arrow.



4-6. NOTE FOR CHECK AND MAINTENANCE OF PRINTED CIRCUIT BOARD

Be sure to turn the power off before inserting or removing printed circuit boards.

4-7. EXTENSION BOARD

The three extension board types are supplied in the BVW-70P. The Amp chassis printed circuit boards can be serviced using the extension board. Simply insert the extension board into the Amp chassis and connect the circuit board to be serviced to the end of the extension board.

Extension board	Connectable Printed Circuit Board
EX-116	SY-61, SY-64P
EX-134	AFM-1, AU-75P, AU-76P, DEC-46P, EN-48P, MD-46P, SV-82, SV-83A, SV-84P, TBC-9P, TC-40P, VO-18P
EX-151	DEC-42P, DM-56P, TBC-7D/7E, TBC-12P

NOTE: In the EX-134 Board, the lever for removing board is installed only on one side.

4-8. SPARE PARTS

(1) The shaded and ⚠ -marked components are critical to safety.
Replace only with the same components as specified.

(2) Replacement parts supplied from the Sony Parts Center will sometimes have a different shape and outside view from the parts which are used in the unit. This is due to "accommodating improved parts and/or engineering changed" or "standardization of genuine parts".

- This manual's exploded views and electrical spare parts lists indicate the part numbers of "the present standardized genuine parts".
- Regarding engineering part changes by our engineering department, refer to Sony service bulletins and service manual supplements.

(3) The parts marked with "s" in the SP column of the exploded views and electrical spare parts lists are normally stocked for replacement purposes. The parts marked with "o" in the SP column are not normally required for routine service work. Orders for parts marked with "o" will be processed, but allow for additional delivery time.

4-9. HOW TO OPERATE THE UNIT WITHOUT INSTALLING CASSETTE TAPE

The following procedures are described without installing the Cassette-up Compartment.

1. Threading

- Turn the power on. The threading ring rotates in a counterclockwise direction automatically, and the unit is put into the threading completion mode.

2. PLAY

- Set DIP switch S106 on the SY-61 board to ON and set System Setup Item 902 to 1. When the PLAY button is pressed, the unit enters the PLAY mode. After adjustment is completed, set the DIP switch and setup menu to the former mode.

3. Unthreading

- Press the EJECT button after the unit is put into the threading completion mode. The threading ring rotates in a clockwise direction.

4. Search

- Turn the SEARCH dial after the unit is put into the threading completion mode.

5. F.FWD and REW

- Select The DIP switch and setup menu as in Step 2. When the F.FWD or REW button is pressed, the unit enters the F.FWD or REW mode. After adjustment is completed, set the DIP switch and setup menu to the former mode.

6. REC

Select the DIP switch and setup menu as in Step 2. (After adjustment is completed, set them to the former mode.)

Small Cassette

- Press the PLAY and the REC buttons while pressing the MISS-REC switch for small cassette on the left side after the unit is put into the threading completion mode.

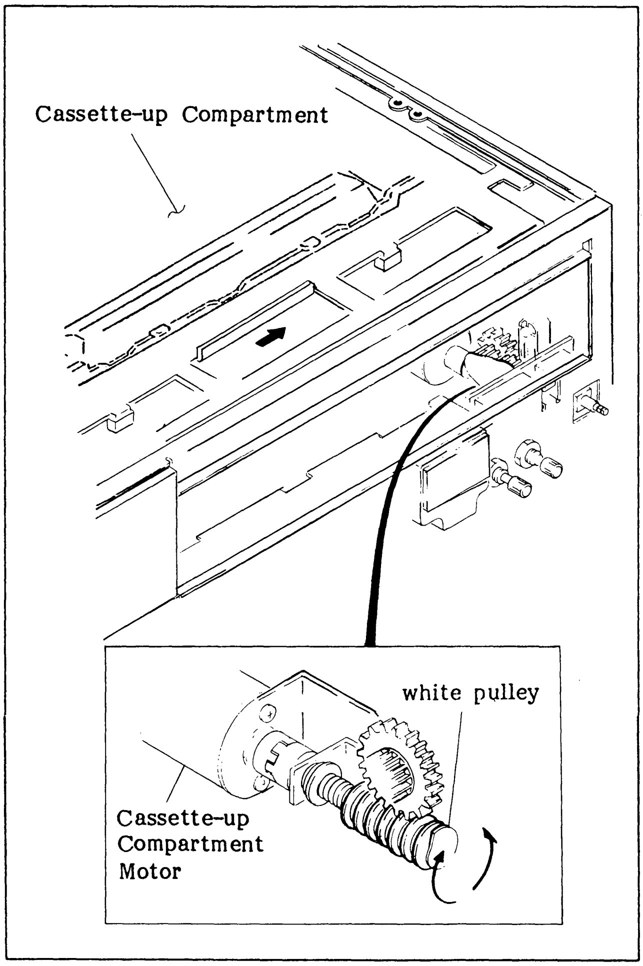
Large Cassette

- Press the PLAY and the REC buttons while pressing the MISS-REC switch for large cassette on the right side after the unit is put into the threading completion mode.

4-10. HOW TO REMOVE A CASSETTE WHEN THE TAPE IS SLACKENED IN THE UNIT

When the tape in the unit is slack, remove the cassette tape by the following procedures:

1. Turn the power off.
2. Open the RP-29P Boards Block.
3. Turn the pulley of the Gear Box Block until the Pinch Roller enters the EJECT completion mode.
4. Remove the Cassette-up Compartment Stay.
5. Disconnect connector CN331 on the CL-14 Board of the Cassette-up Compartment.
6. Pull out the function control Panel, raise it 90 degrees, and fix it.
7. Turn the white pulley as shown in the figure by hand while holding the cassette lid by hand to prevent it closing so that the Cassette-up Compartment moves up.

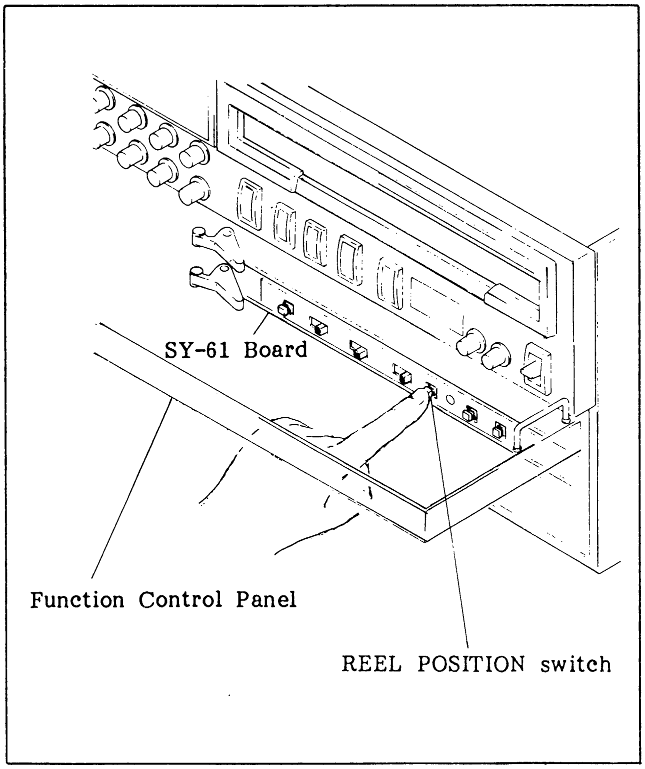


8. Stop rotating the white pulley just before the Cassette-up Compartment moves to the surface.
9. Lift the Cassette-up Compartment slowly from the unit while holding the cassette lid.
10. Close the cassette lid carefully so that it is not damaged.
11. Remove the cassette from the Cassette-up Compartment.
12. Release the lock of the cassette lid, wind the tape into the cassette by turning the reel hub on the back of the cassette by hand.
13. Turn the pulley as Step 7 so that the stage of the Cassette-up Compartment moves the cassette out position.
14. Install the Cassette-up Compartment into the unit.
15. Connect the connector, then install the Cassette-up Compartment Stay.
16. Clean the Motor Belt of the Gear Box Block with a cloth moistened with cleaning fluid.
17. Locate the cause of the trouble and remedy the problem.

4-11. HOW TO CHECK THE REEL TABLE OPERATION

- When power is turned on, you can check whether the Reel Table moves to the specified position without inserting the cassette tape.
- If the Cassette-up Compartment is not installed when the mechanism is adjusted, the Reel Table can be moved to the position corresponding to an L or S cassette according to the procedures below.

1. Disconnect connector CN331 on the CL-14 Board of the Cassette-up Compartment.
2. Turn the power on.
3. Press the EJECT button on the Function Control Panel.
4. Open the Function Control Panel and press the REEL POSITION select switch on the SY-61 Board.



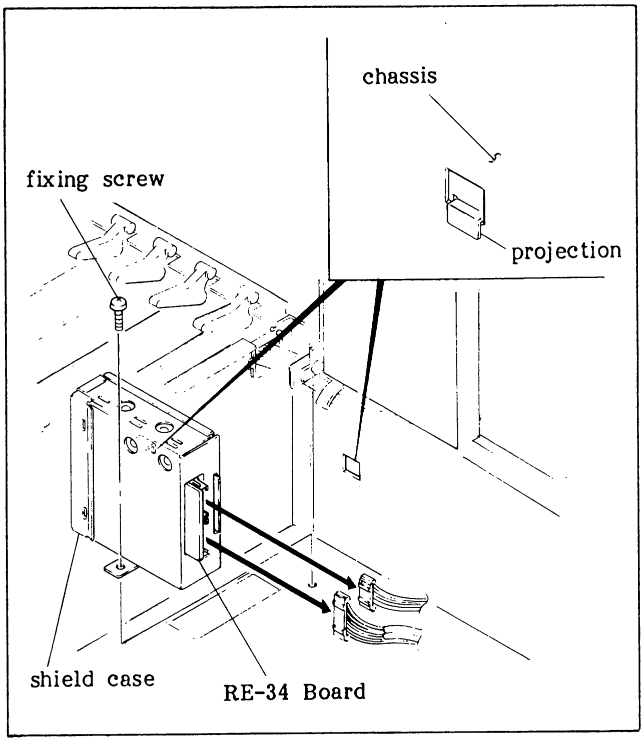
5. The Reel Table moves.
   The set enters S mode from L mode or enters L mode from S mode. When the REEL POSITION select switch is pressed again, the set returns to the original mode.

4-12. SERVICE OF THE CIRCUIT BOARD

The method of servicing circuit boards (except plug-in boards) is described below.

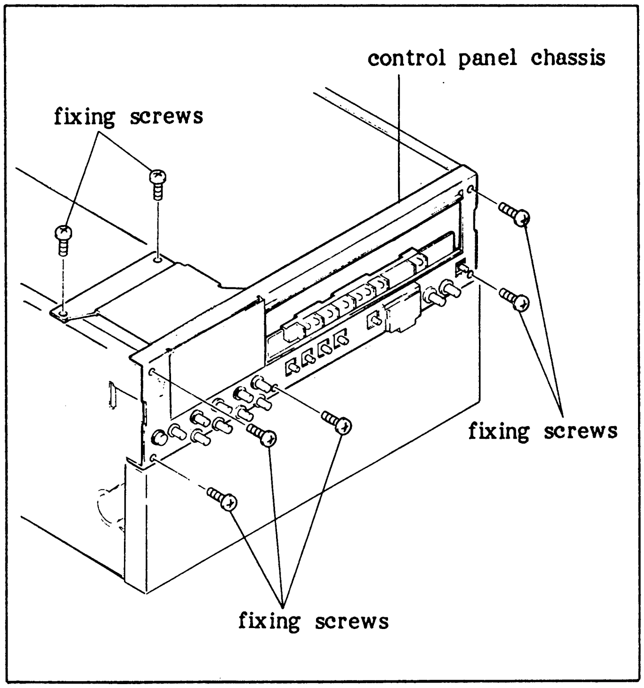
RE-34 Board

1. Remove the Upper Panel.
2. Open the RP-29P Boards Block.
3. Remove a fixing screw of the shield case.
4. Disconnect the harness connectors.
5. Remove the RE-34 Board from the unit.
6. When installing, hook the projection of the shield case into the chassis.

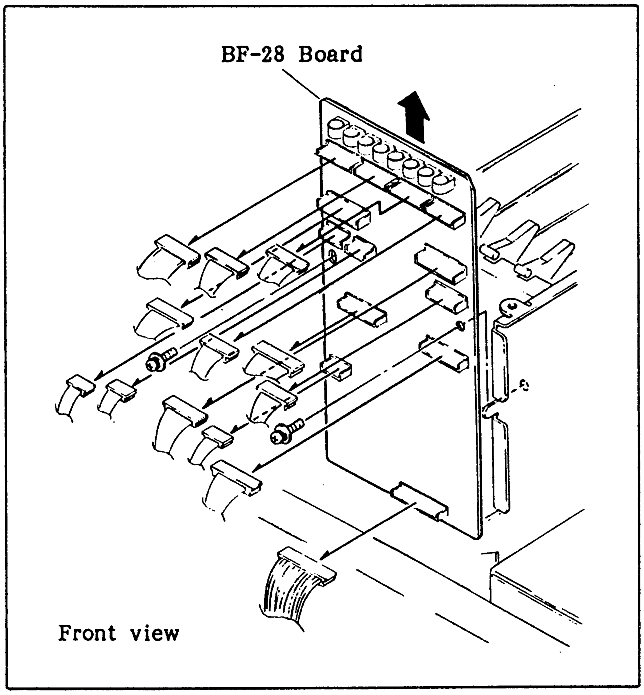


BF-28 Board

1. Remove the Upper Panel and Control Panel.
2. Remove the Cassette-up Compartment.
3. Remove the seven fixing screws shown in the figure, remove the control panel chassis.

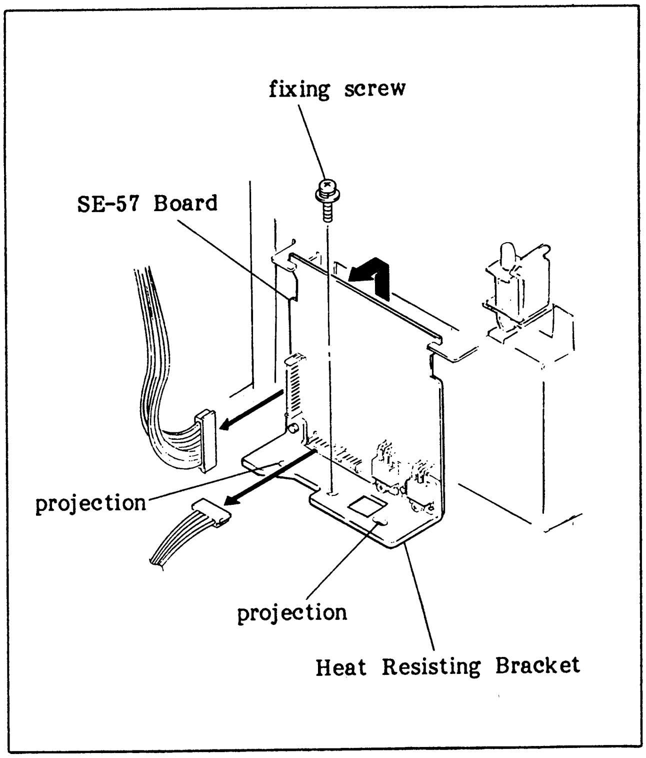

control panel chassis
fixing screws
fixing screws
fixing screws

4. Disconnect the connectors.
5. Remove the two fixing screws, remove it from the unit.


BF-28 Board
Front view

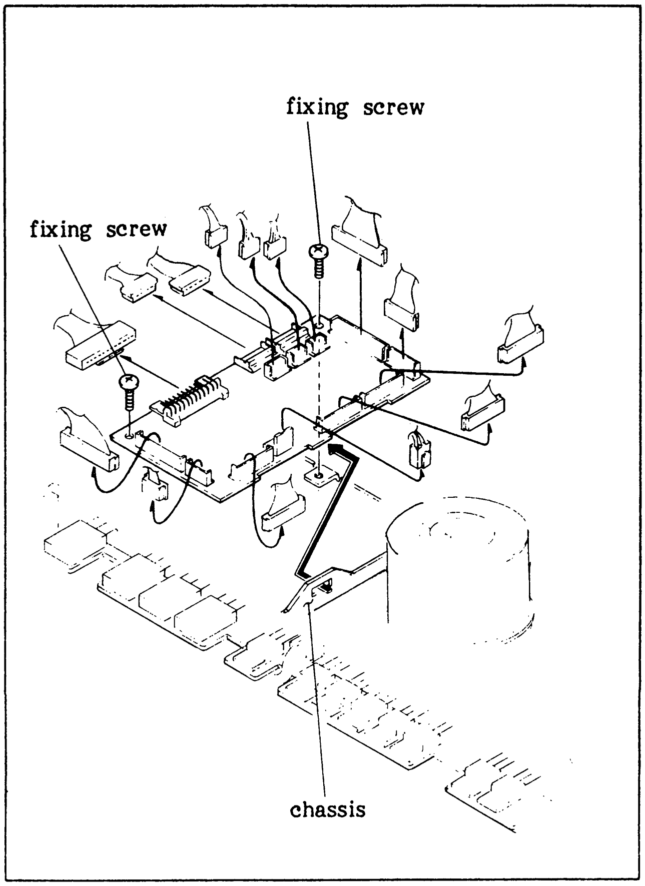
SE-57 Board

1. Remove the Upper Panel.
2. Open the RP-29P Boards Block.
3. Remove a fixing screw of the Heat Resisting Bracket.
4. Disconnect the connectors.
5. Remove the SE-57 Board from the unit.
6. When installing, fit the two projections of the Heat Resisting Bracket into the chassis.


fixing screw
SE-57 Board
projection
projection
Heat Resisting Bracket

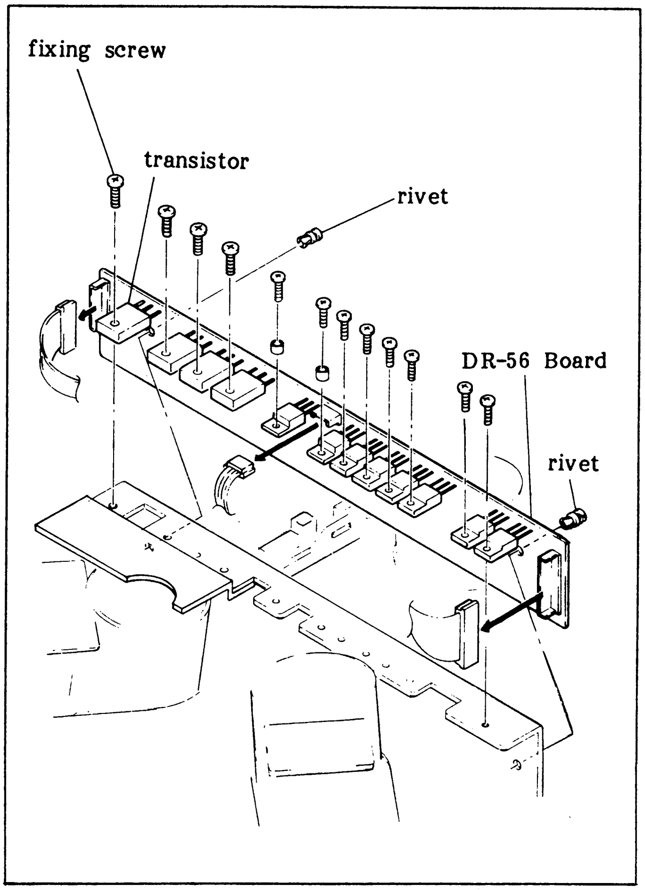
RE-28 Board

1. Set the Reel Table to S mode by pressing the REEL POSITION select switch on the SY-61 Board.
2 Remove the SY-61 and SY-64P Boards.
3. Remove the Lower Panel.
4. Remove the Reel Table Transfer Motor Block.
5. Disconnect the connectors.
6. Remove the two fixing screws and remove the RE-28 Board from the unit.
7. When installing, hook one side of the RE-28 Board into the chassis and tighten the screws.


fixing screw
fixing screw
chassis

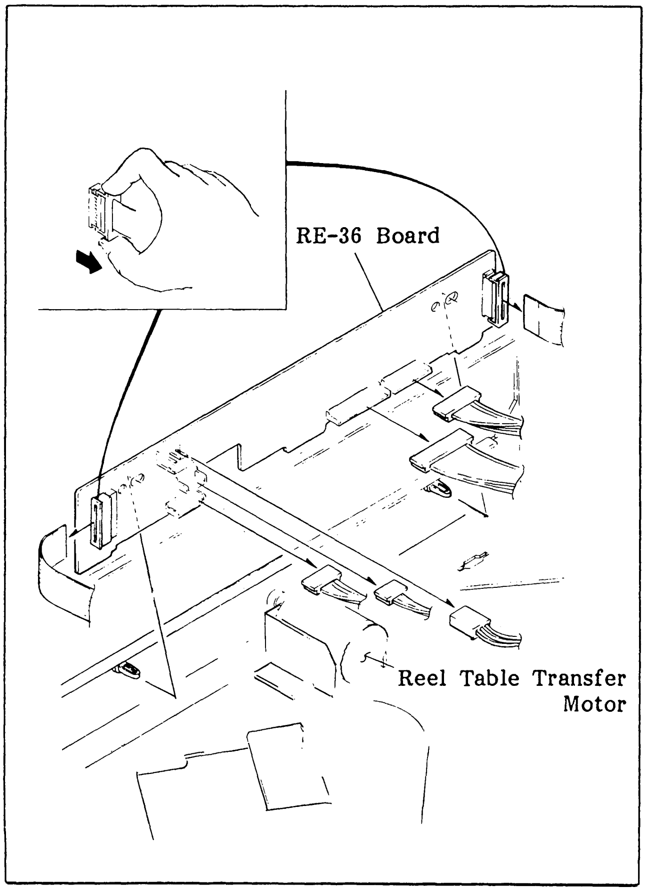
DR-56 Board

1. Remove the SY-61 and SY-64P Boards.
2. Remove the Lower Panel.
3. Disconnect the connectors.
4. Remove the two rivets and twelve fixing screws of the transistors.
5. Remove the DR-56 Board from the unit.


fixing screw
transistor
rivet
DR-56 Board
rivet

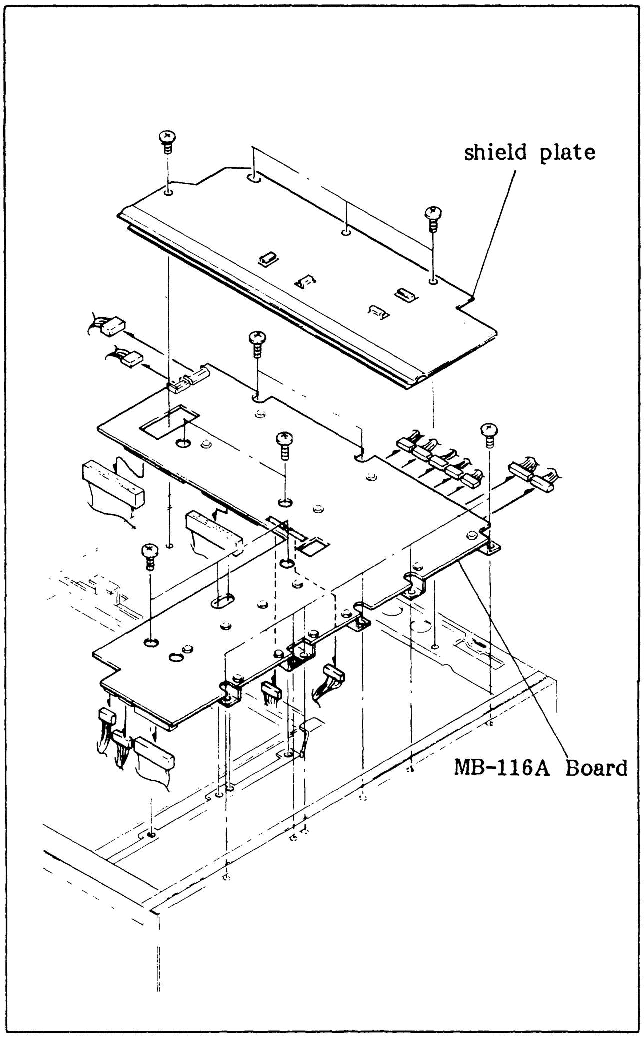
RE-36 Board

1. Put the unit into the small cassette mode to turn the Reel Table Transfer Pulley.
2. Remove the SY-61 and SY-64P Boards.
3. Remove the Lower Panel.
4. Remove the Reel Table Transfer Motor.
5. Remove the RE-36 Board from the unit.
6. Disconnect the connectors and flat cables.


RE-36 Board
Reel Table Transfer Motor

MB-191A Board

1. Remove the Upper Panel.
2. Remove the plug-in type printed circuit boards.
3. Disconnect the connectors on the inside.
4. Remove the Lower Panel.
5. Remove the shield plate of the MB-191A Board.
6. Remove the fourteen fixing screws of the MB-191A Board.
7. Disconnect the connectors.


shield plate
MB-116A Board

SY-61 and SY-64P Boards

1. Open the Function Control Panel.
2. Loosen the fixing screws and slide the SY stopper in the direction indicated by arrow A.
3. Tighten the fixing screws, then remove the SY-61 and SY-64P Boards.
4. Insert the Boards, then loosen the fixing screws. Slide the SY stopper in the direction indicated by arrow B while slightly pulling the Board Lever toward you.
5. Tighten the fixing screws.

NOTE: When the set is transported, be sure to fix the SY stopper as shown in Fig. 1.

Fig. 1

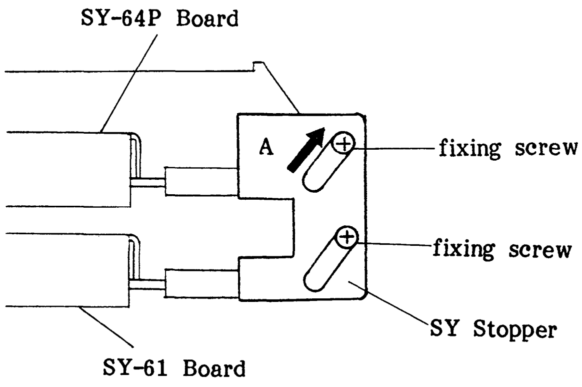
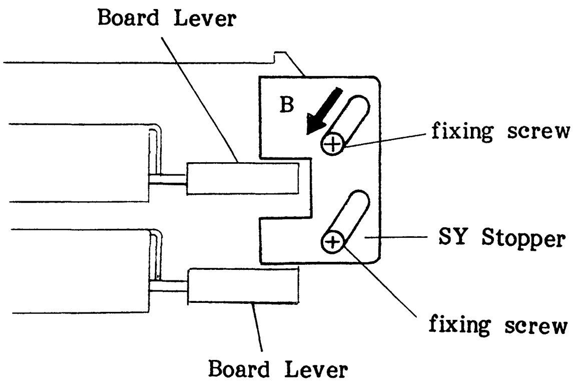
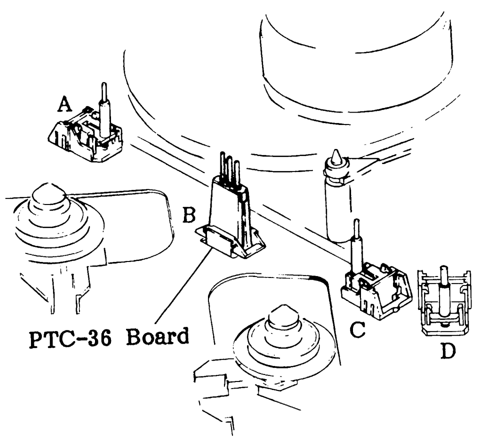

SY-64P Board
A
fixing screw
fixing screw
SY Stopper
SY-61 Board

Fig. 2


Board Lever
B
fixing screw
SY Stopper
fixing screw
Board Lever

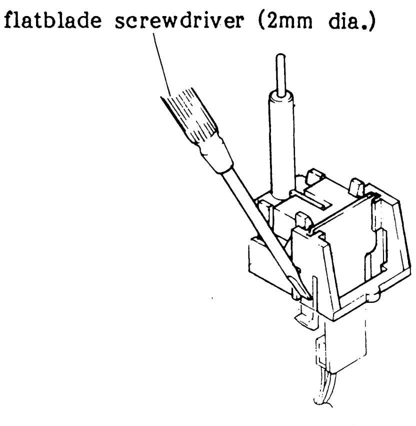
4-13. HOW TO REMOVE THE DETECTION SWITCHES

The method of removing of the four Detection Switches is described below.


A
B
PTC-36 Board
C
D

A: S cassette's miss-REC switch (for Metal tape)
B: Reel hub diameter detection switch
Oxide/Metal tape detection switch
Tape thickness detection switch
C: S cassette's miss-REC switch (for Oxide tape)
D: L cassette miss-REC switch

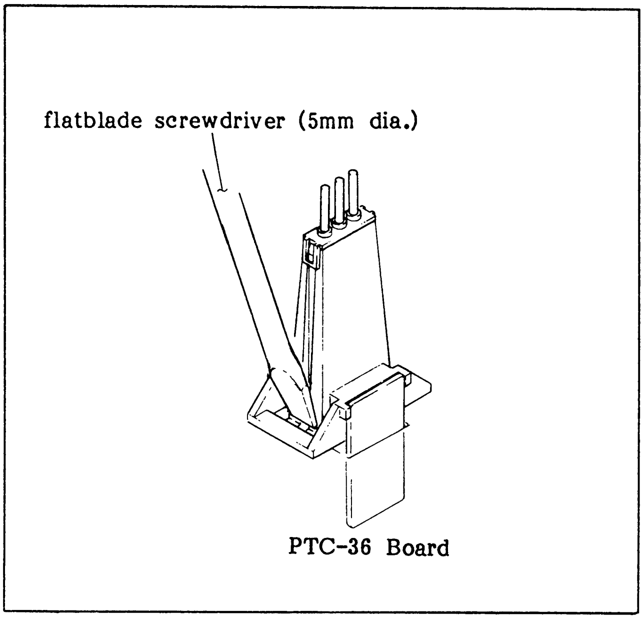
- When removing switches A, C, and D
  While pushing the leg of one side with a flat-blade screwdriver (2 mm dia.), lift it, then pull out the switch.


flatblade screwdriver (2mm dia.)

- When removing switch B

  While pushing the legs of one side (there are two legs each on the right and left sides) with a flatblade screwdriver (5 mm dia.), lift it. Then pull out the switch.

  When installing it, be sure to install the PTC-36 Board in the front side.



NOTE: The detection switch lifts lightly so as not to disconnect the connector.

4-14. NOTE FOR THE SLIP RING

Handle the slip ring on the drum with care because it is easy to bend.

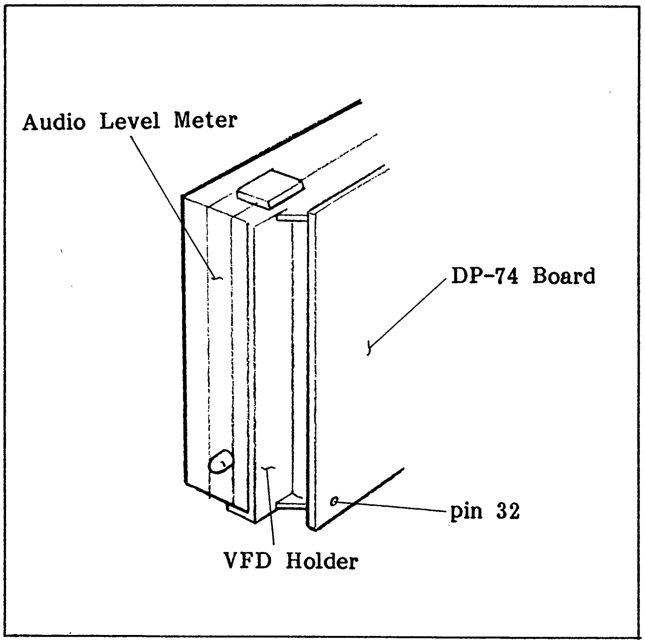
4-15. HOW TO OPEN THE CASSETTE LID

Large cassette:	The lid is opened by releasing the projecting locks on both sides of the cassette.
Small cassette:	The lid is opened by releasing the projecting lock on the left side as viewed from the top of the cassette.

4-16. REPLACEMENT OF AUDIO LEVEL METER

Repair or replace the audio level meter on the upper left of the front panel and install it on the front chassis as follows:

1. Check that pin 32 of the audio level meter is less than 1mm long from the DP-74 board.
2. If pin 32 is more than 1mm long, it may touch the shield case. Cut off the pin using a nipper so that it is less than 1mm.



4-17. FIXTURE

Part number	Description	For use
J-6001-820-A	Drum Eccentricity Gauge (3)	Upper drum eccentricity adjustment
J-6001-830-A	Drum Eccentricity Gauge (2)	
J-6001-840-A	Drum Eccentricity Gauge (1)	
J-6031-820-A	Multi Connector Cable (BIBNC)	Video alignment
J-6080-011-A	Reel Table Tension Gauge	Brake torque adjustment
J-6086-570-A	Flatness Plate	Audio/TC head slantness adjustment
J-6087-000-A	Drum Eccentricity Gauge (5)	Upper drum eccentricity adjustment
J-6152-450-A	Wire Clearance Gauge	Clearance check
J-6190-800-A	Tension Regulator Slantness Check Tool	Tension regulator slantness check
J-6320-680-A	Reel Table Height Gauge	Reel table height adjustment
J-6320-870-A	Reel Motor Shaft Slantness Check Gauge	Reel motor shaft slantness adjustment
J-6320-880-A	Cassette Reference Plate (L)	Reel table adjustment
3-184-527-01	Cleaning Piece	Cleaning
7-723-902-00	Inspection Mirror	Video tracking adjustment
7-732-050-20	Tension Scale (50 g full scale)	Tension adjustment
7-732-050-30	Tension Scale (100 g full scale)	
8-960-096-51	Alignment Tape, CR2-1B PS	Video tracking tape
8-960-096-86	Alignment Tape, CR8-1B PS	Audio adjustment
8-960-096-91	Alignment Tape, CR5-1B PS	Video and audio alignment for recorder and player (metal particle tape)
8-960-098-44	Alignment Tape, CR5-2A PS	Video and servo alignment for recorder and player (oxide tape)
8-960-098-45	Alignment Tape, CR8-1A PS	Audio alignment for recorder and player (oxide tape)
9-911-053-00	Thickness Gauge	Clearance check
9-919-573-01	Cleaning Fluid	Cleaning
Standard Products	Head Demagnetizer (HE-4)	Head demagnetizing

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SECTION 5
REPLACEMENT OF MAJOR PARTS

5-1. REPLACEMENT OF THE REEL MOTOR

. Replacement procedures for the Take-up Reel Motor and the Supply Reel Motor are the same.

Tool: Hex. key (across flat has 1.5 mm)
Mode: Unthreading end mode
Replacement procedure:

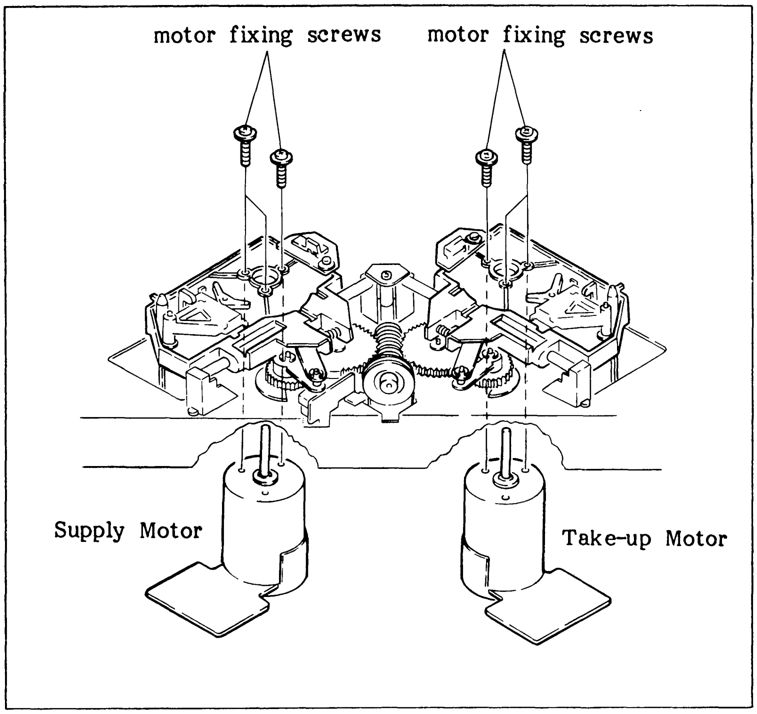
(1) Open the Function Control Panel, remove the SY-61 and SY-64P Boards.
(For the SY-64P Board, remove the cable from the KY-96A Board on the back of the Control Panel Block.)

(2) Disconnect the three connectors of the RM-40 Board on the motor from the back of the unit.

(3) Remove the Reel Table as described in replacement procedures (1) to (4) of Section 5-2, Replacement of the Reel Table.

(4) Remove the three fixing screws of the motor as shown in the figure, replace it with a new one.

(5) Perform the adjustments in Section 5-23.



5-2. REPLACEMENT OF THE REEL TABLE

- Replacement procedures for the Take-up Reel Table and the Supply Reel Table are the same.

Tool: Hex. key (across flat has 1.5 mm)

Replacement procedure:

(1) Turn the Reel Table by hand so that the one of the two notches under the Reel Table is in the groove of the Motor Plate Ass'y.

(2) Insert the hex. key along the groove into the Reel Table, loosen the fixing screw.

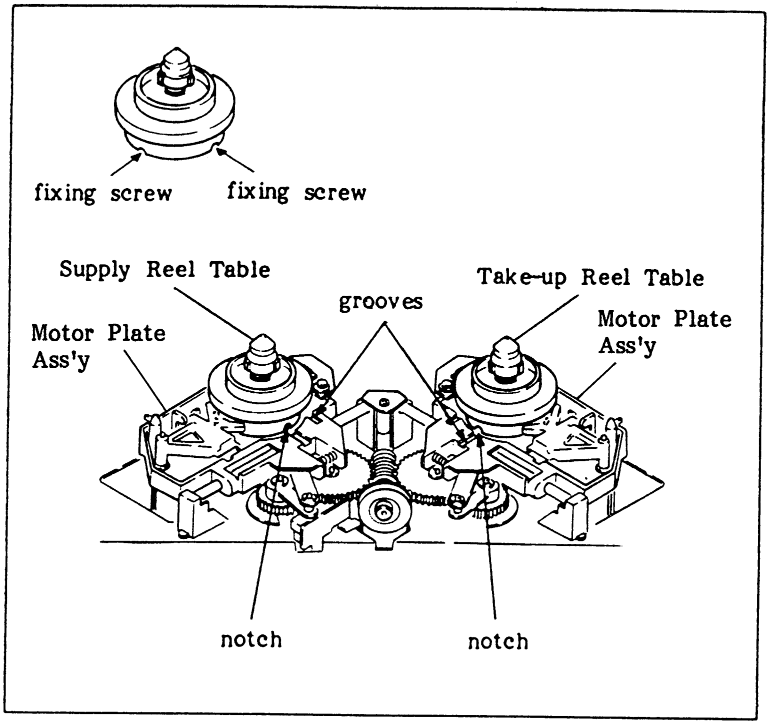
(3) Turn the Reel Table more so that the other notch is in the groove of the Motor Plate Ass'y.

(4) Loosen the fixing screw of the Reel Table as described in procedure (2).

(5) Replace the Reel Table with a new one. (Be careful not to drop the washer.)

(6) Clean the outer circumference of the Reel Table with a cloth moistened with cleaning fluid.

(7) Perform the adjustments in Section 5-23.


fixing screw
fixing screw
Supply Reel Table
Take-up Reel Table
grooves
Motor Plate Ass'y
Motor Plate Ass'y
notch
notch

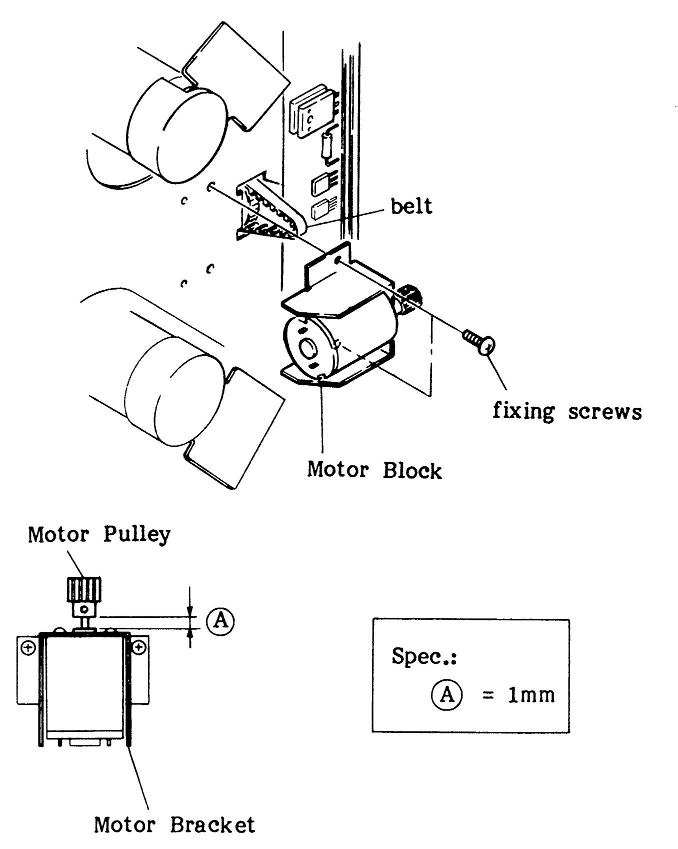
5-3. REPLACEMENT OF THE REEL TABLE TRANSFER MOTOR

Tool: Hex. key (across flat has 1.27 mm)

Replacement procedure:

(1) Remove the SY-61 and SY-64P Boards, put on the unit right side down.
(2) Remove the two fixing screws as shown in the figure, remove the Motor Block from the unit.
(3) Unsolder the two motor leads.
(4) Remove the setscrew of the Motor Pulley.
(5) Remove the two fixing screws from the Motor Bracket, replace it with the new one.
(6) Solder the white lead to the "+" terminal of the motor and the red lead to the other terminal.
(7) Install the Motor Pulley so that the clearance between the pulley and the Motor meets the required specification.
(8) Hook the Reel Table Transfer Belt to the Motor Pulley, then install the Motor Block on the unit.

<Rear View with the Unit Put on the Lower Right>

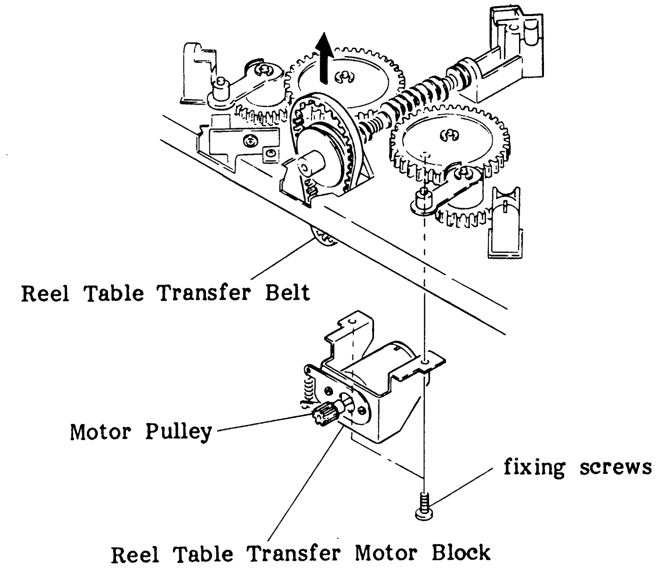

belt
fixing screws
Motor Block
Motor Pulley
Ⓐ
Motor Bracket

Spec.:
Ⓐ = 1mm

5-4. REPLACEMENT OF THE REEL TABLE TRANSFER BELT

Replacement procedure:

(1) Open the Function Control Panel. Remove the SY-61 and SY-64P Boards from the unit.
(2) Remove the Reel Table Transfer Motor Block from the back side of the unit.
(3) Remove the Reel Table Transfer Belt from the top of the unit, replace the belt with a new one.
(4) Hook the belt to the Motor Pulley of the Reel Table Transfer Motor Block, install it in the unit.


Reel Table Transfer Belt
Motor Pulley
fixing screws
Reel Table Transfer Motor Block

5-5. REPLACEMENT OF THE MOTOR PLATE ASSEMBLY

- Replacement procedures for the take-up side and the supply side are the same.

Replacement procedure:

(1) Remove the Reel Table as described in replacement procedures (1) to (4) of Section 5-2.

(2) Remove the Slide Shaft Retainer.

(3) Move the Slide Shaft in the direction of the arrow and remove it. Lift the Motor Plate Ass'y, disconnect the flat cable CN883 on the RM-40 Board.

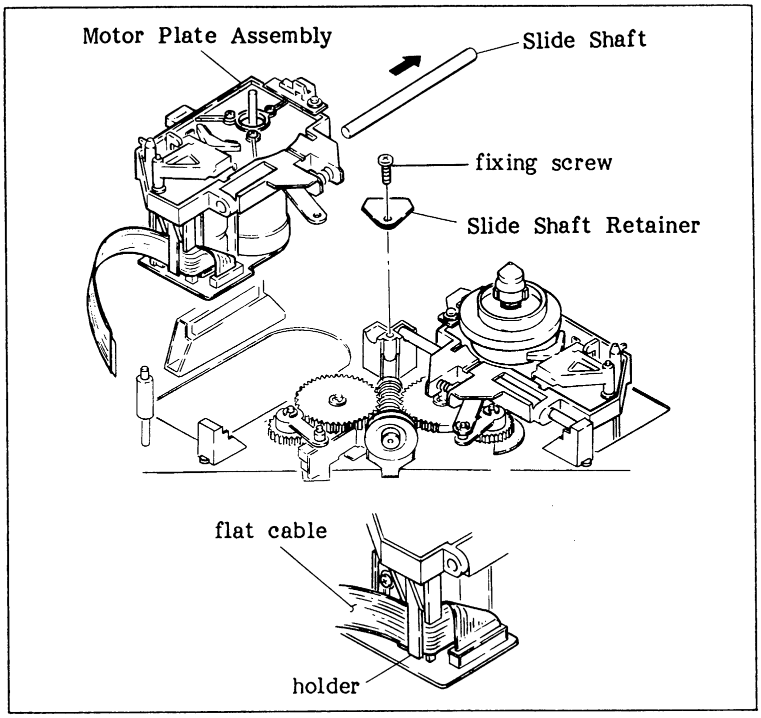
(4) Connect the flat cable to the RM-40 Board on the new Motor Plate Ass'y. Insert the flat cable into the holder as shown in the figure.

(5) Clean the Slide Shaft with a cloth moistened with cleaning fluid.

(6) Insert the Slide Shaft, and then install it in the unit.

(7) Install the Slide Shaft Retainer.

(8) Perform the adjustments in Section 5-23.


Motor Plate Assembly
Slide Shaft
fixing screw
Slide Shaft Retainer
flat cable
holder

5-6. REPLACEMENT OF THE REEL TABLE BRAKE

Replacement procedure:

(1) Remove the Reel Table as described in replacement procedures (1) to (4) of Section 5-2.

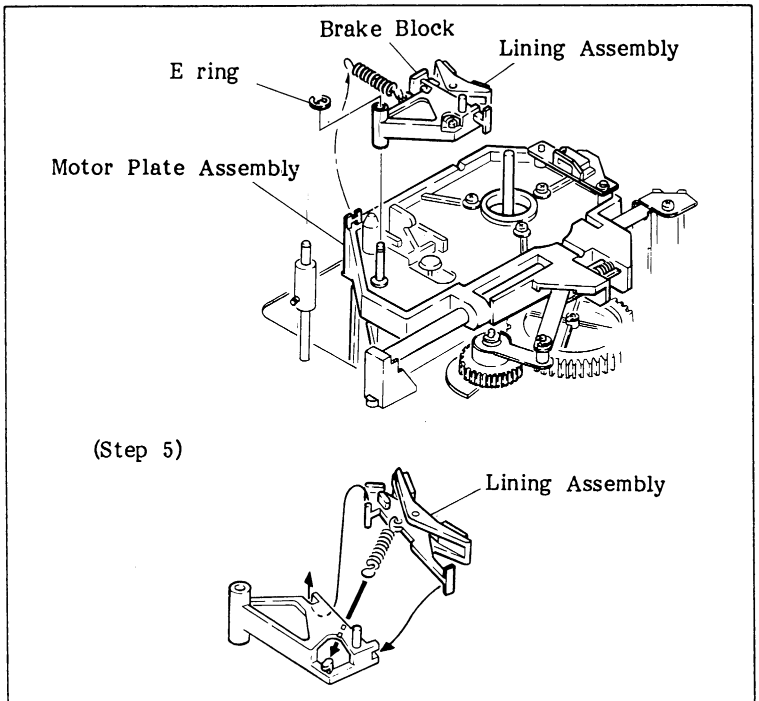
(2) Remove the E ring as shown in the figure.

(3) Remove the spring on the Motor Plate Ass'y side.

(4) Remove the Brake Block.

(5) Remove the spring of the Brake Block as shown in the figure, then remove the Lining Ass'y.

(6) Replace it with a new one, reassemble in the reverse order.


Brake Block
E ring
Lining Assembly
Motor Plate Assembly
(Step 5)
Lining Assembly

5-7. REPLACEMENT OF THE UPPER DRUM

- The Rotary Video Heads cannot be replaced individually, the entire Upper Drum Assembly must be replaced when any one of these heads fails.
- The printed circuit board of the Upper Drum Assembly be able to use for the new drum.

Tool: Drum eccentricity gauge (1)
Drum eccentricity gauge (2)
Drum eccentricity gauge (3)
Drum eccentricity gauge (5)
Cleaning fluid
Cleaning piece

Replacement procedure:

(1) Remove the Cleaning Roller Block.

(2) Disconnect connector CN662 on the SR-26 Board of the Brush Block.

(3) Remove the Brush Cover and the brush of the Slip Ring Block.

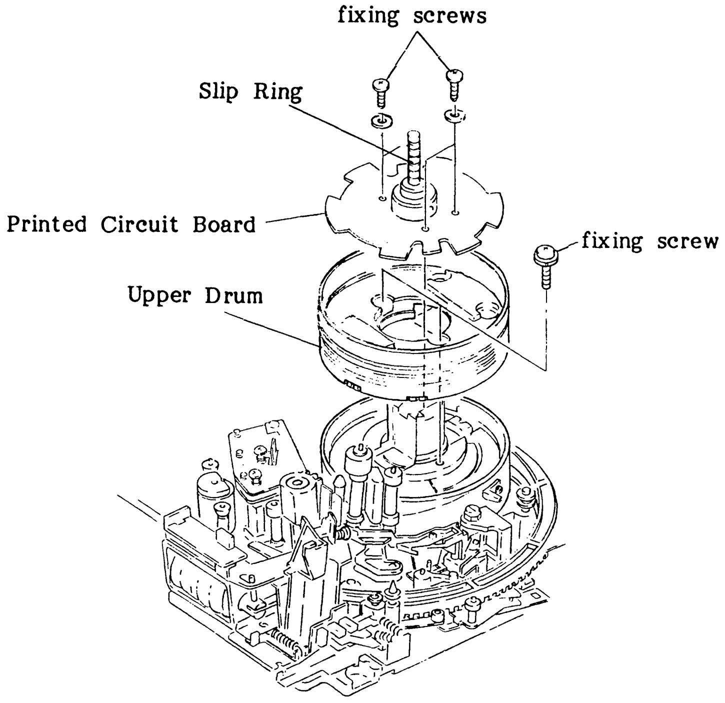
(4) Remove the fixing screws of the Slip Ring, then remove the Slip Ring.

(5) Unsolder the twenty leads on the printed circuit board of the Upper Drum. Remove the four fixing screws of the printed circuit board, then remove the printed circuit board from the Upper Drum Ass'y.

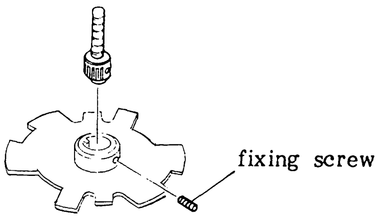
(6) Remove the two fixing screws of the Upper Drum Ass'y, and then remove the Upper Drum Ass'y from the unit.

(7) Clean the contacting surfaces of the flange and new Upper Drum Ass'y with a cloth moistened with cleaning fluid. (If there is a spacer between the drum and the flange, it should be remain in place, or be reinstalled in the same place with the new Upper Drum Ass'y. The spacer is 0.01 mm, 0.03 mm, or 0.1 mm.)

<Removing the Connector>



Slip Ring



(8) Install the printed circuit board on the Upper Drum Ass'y with four fixing screws so that the marked "A" on the printed circuit board is placed to marked "A" on the Upper Drum Ass'y.

(9) Place the marked "A" on the printed circuit board with the marked "A" of the Lower Drum Ass'y. Thread snugly with two fixing screws but do not tighten.

Adjustment procedure:

(1) Assemble the drum eccentricity gauges (1), (2), (3), and (5) as shown in the figure. Remove the screws shown in the figure and mount the assembled gauges in the hole so that the tip probe is positioned about 5 mm from the overmost circumference top edge of the Upper Drum.

(2) Turn the Upper Drum slowly clockwise direction and confirm that the pointer deflection of the gauge is within 5 microns during one complete turn of the Upper Drum. If this specification is satisfied, proceed to Step (5). If it is not, perform then continue with the remaining Steps.

(3) Tap the top outer circumference of the Upper Drum with a nylon hammer or a screwdriver handle so that the gauge deflection remains within 5 microns.

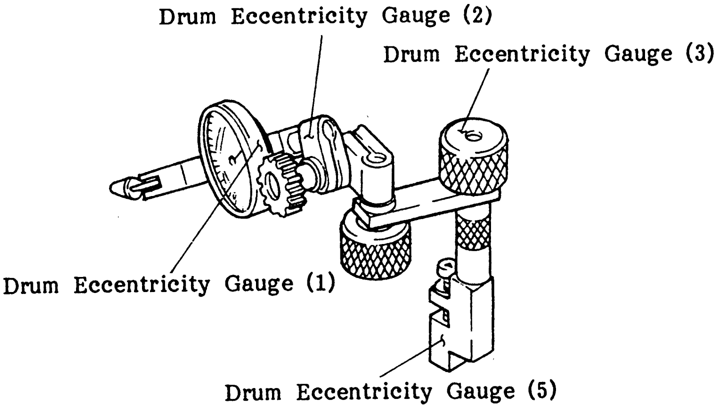
(4) After adjustments, tighten the two fixing screws that secure the Upper Drum alternately and gradually using a tightening torque of 8 kg. cm.

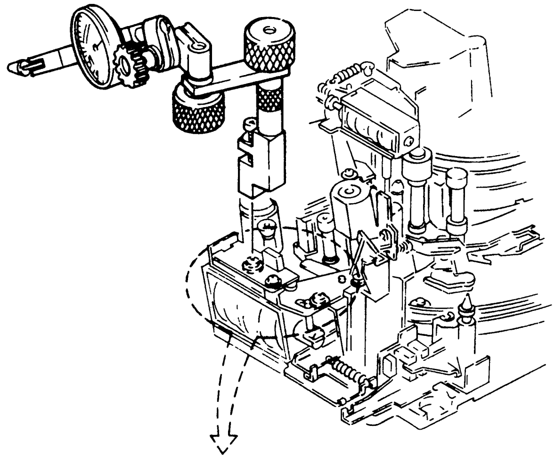
(5) After the screws are tightened, check again that the eccentricity of the Upper Drum is within 5 microns.

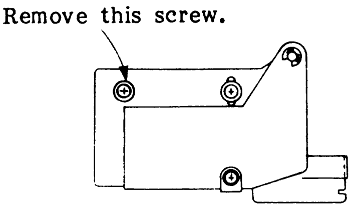
(6) Solder the twenty leads.

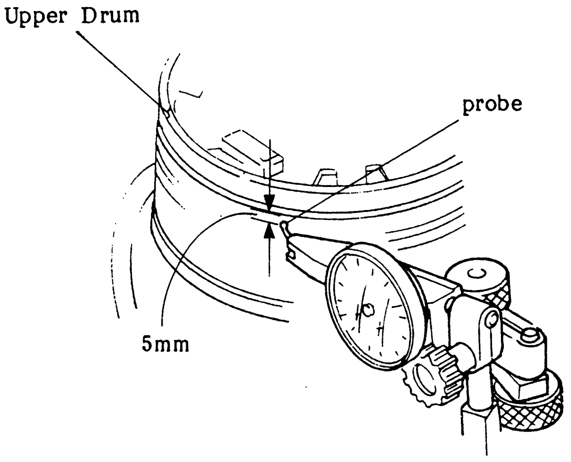
(7) Install the brush, Brush Cover, and Cleaning Roller Block and connect the connectors.

(8) Perform the adjustments in Section 5-23.


Drum Eccentricity Gauge (2)
Drum Eccentricity Gauge (3)
Drum Eccentricity Gauge (1)
Drum Eccentricity Gauge (5)







5-8. REPLACEMENT OF THE DRUM ASSEMBLY

Replacement procedure:

(1) Remove the Cleaning Roller Block.

(2) Disconnect connector CN662 on the SR-26 Board of the Brush Block.

(3) Remove the Brush Cover and the brush of the Slip Ring Block.

(4) Disconnect connectors CN114, CN115, CN116, and CN117 on the MB-191A Board.

(5) Disconnect connectors CN812 and CN823 on the RE-28 Board.

(6) Disconnect connectors CN641, CN642, CN643, and CN644 on the RP-29P Board.

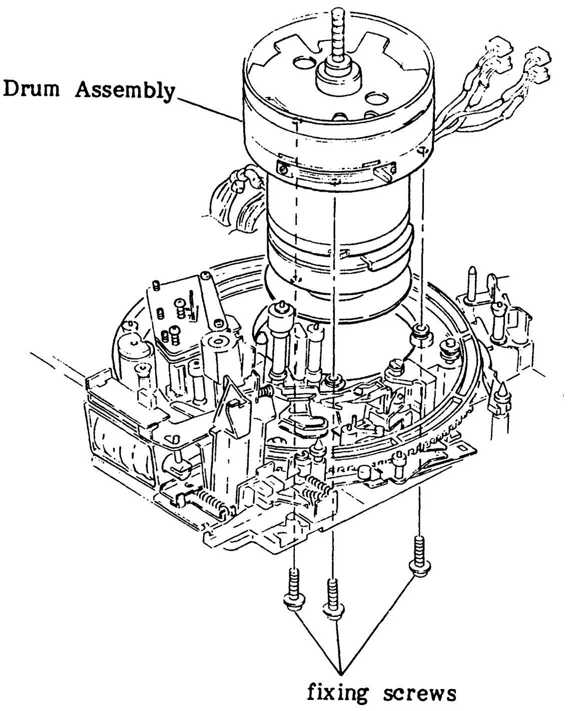
(7) Remove the three fixing screws on the back of the unit, and then remove the defective drum.

(8) Install the Drum Ass'y on the base. Tighten the fixing screws while turning the Drum Ass'y in a counterclockwise direction as viewed from top of the unit.

(9) Connect the connectors of the drum harness.

(10) Install the brush, Brush Cover, and Cleaning Roller Block and connect the connector on the SR-26 Board.

(11) Perform the adjustments in Section 5-23.



5-9. REPLACEMENT OF THE BRUSH ASSEMBLY

Replacement procedure:

(1) Remove the Cleaning Roller Block.

(2) Remove the fixing screw, remove the Brush Cover.

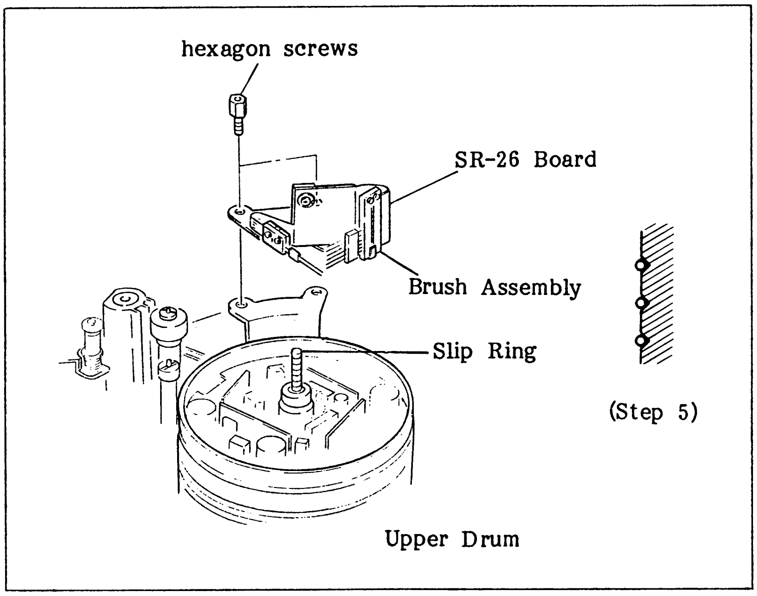
(3) Disconnect connector CN662 on the SR-26 Board.

(4) Remove the two hexagon screws, replace the Brush Ass'y with a new one.

(5) Check that the Brush touches the Slip Ring as shown in the figure.

(6) Install the Brush Cover, the connector on the SR-26 Board, and the Cleaning Roller Block.

(7) Perform the adjustments in Section 5-23.



5-10. REPLACEMENT OF THE CAPSTAN MOTOR

Replacement procedure:

(1) Open the Function Control Panel, remove the SY-61 and SY-64P Boards.

(2) Remove the two fixing screws of the Pinch Solenoid Block, and then remove the Pinch Solenoid Block from the unit.

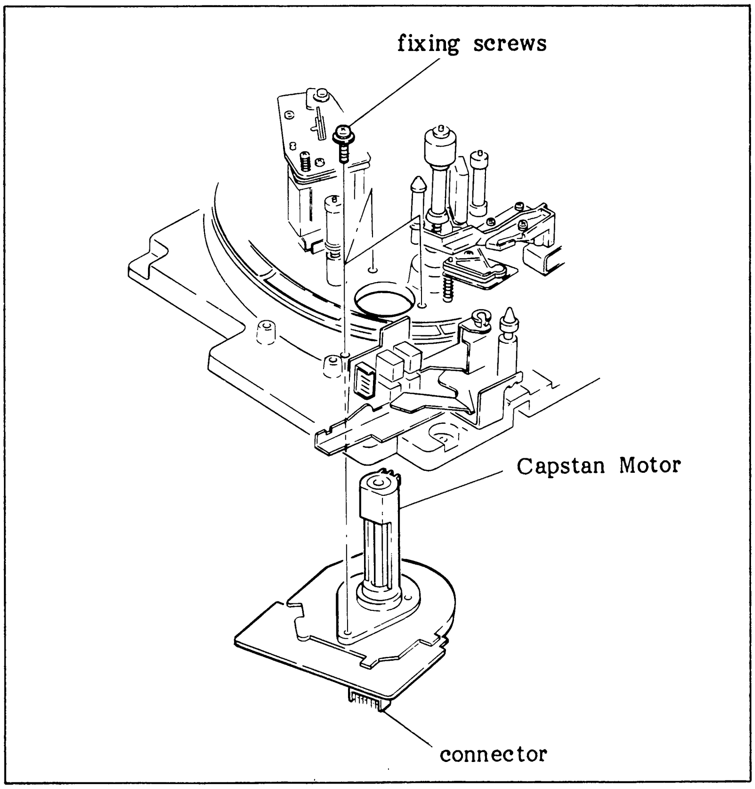
(3) Disconnect connector CN1 of the Capstan Motor on the back of the unit.

(4) Remove the three fixing screws (a fixing screw is under the Pinch Solenoid Block); remove the Capstan Motor from the unit.

(5) Install the new Capstan Motor. Tighten the three fixing screws while turning the motor in the clockwise direction, as viewed from top of the unit.

(6) Install the Pinch Solenoid Block in the unit.

(7) Perform the adjustments in Section 5-23.



5-11. REPLACEMENT OF THE AUDIO/TC HEAD

- The Audio/TC Head and the Audio Confidence Head are combined in one unit: Called the AT Head Block.

Replacement procedure:

(1) Remove the Cleaning Roller Block.

(2) Remove the two fixing screws of the AT Head Block, then remove the AT Head Block from the unit.

(3) Unsolder the six leads on the board (upper portion) of the Audio/TC Head.

(4) Remove the two fixing screws as shown in the figure, then remove the Audio/TC Head Block from the AT Head Block.

(5) Remove the fixing screw of the AT Shield Case (2) in the lower portion. Remove the AT Shield Case (2) from the Audio/TC Head Block.

(6) Remove the two fixing screws of the AT Shield Case (1), then remove the Audio/TC Head.

(7) Unsolder the six leads on the board (lower portion) of the Audio/TC Head.

(8) Replace the Audio/TC Head with a new one.

(9) Install the Audio/TC head in the reverse order of Steps (1) to (7).

(10) After replacement, perform the adjustments in Section 5-23.

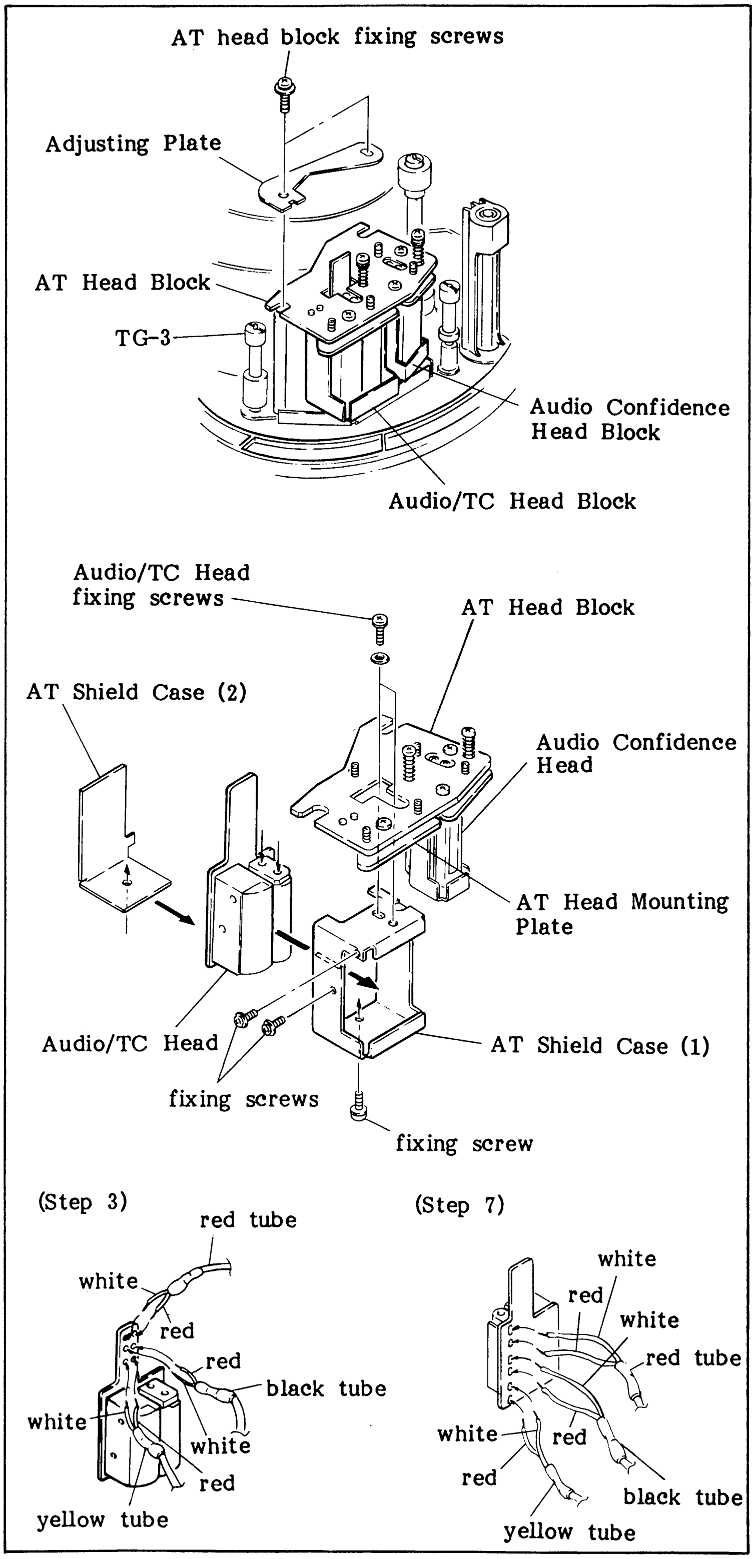
- Perform the preparation as follows:

(i) AU-76P Board

Turn DIP switches S101-Bit 1, S102-Bit 1, S201-Bit 1, and S202-Bit 1 to ON. Turn Bits 2, 3, and 4 of these switches to OFF.

(ii) AU-76P Board

Turn RV101, RV110, RV201, and RV210 clockwise as far as they will go.


AT head block fixing screws
Adjusting Plate
AT Head Block
TG-3
Audio Confidence Head Block
Audio/TC Head Block
Audio/TC Head fixing screws
AT Head Block
AT Shield Case (2)
Audio Confidence Head
AT Head Mounting Plate
Audio/TC Head
AT Shield Case (1)
fixing screws
fixing screw
(Step 3)
red tube
white
red
red
black tube
white
white
red
yellow tube
(Step 7)
white
red
white
red tube
white
red
red
black tube
yellow tube

5-12. REPLACEMENT OF THE AUDIO CONFIDENCE HEAD

Replacement procedure:

(1) Remove the Cleaning Roller Block.

(2) Remove the two fixing screws of the AT Head Block, then remove the AT Head Block from the unit.

(3) Remove the two fixing screws as shown in the figure, then remove the Audio Confidence Head Block from the AT Head Block. (At this time, the CF Shield Case is removed, too.)

(4) Unsolder the four leads on the board of the Audio Confidence Head.

(5) Replace the Audio Confidence Head with a new one.

(6) Solder the four leads on the board.

(7) Insert the Audio Confidence Head into the Shield Case, then install it on the CF Head Bracket with the two fixing screws and the two washers while pushing in the direction of the arrow.

(8) Install the Audio Confidence Head in the reverse order of Steps (1) and (2).

(9) After replacement, perform the adjustments in Section 5-23.

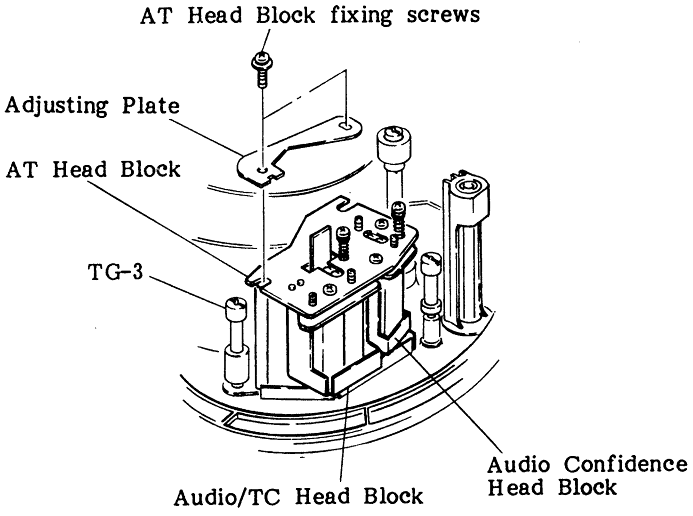
. Perform the preparation as follows:

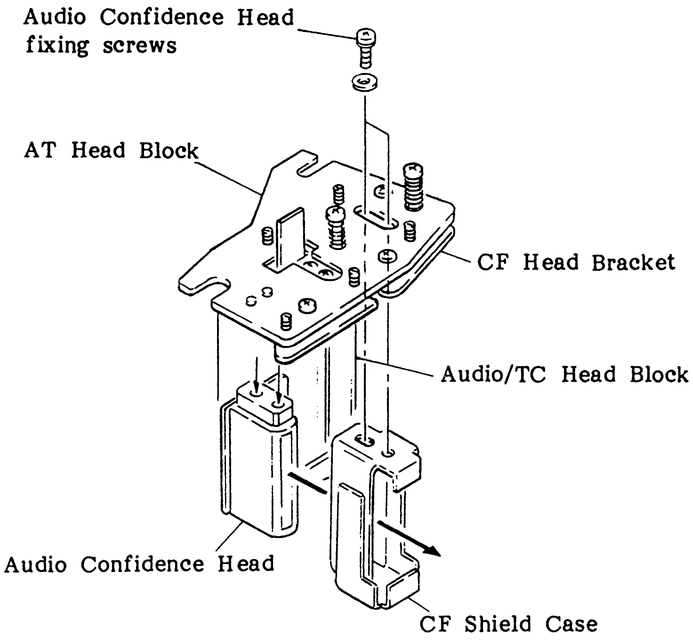
(i) AU-76P Board

Turn DIP switches S101-Bit 1, S102-Bit 1, S201-Bit 1, and S202-Bit 1 to ON. Turn Bits 2, 3, and 4 of these switches to OFF.

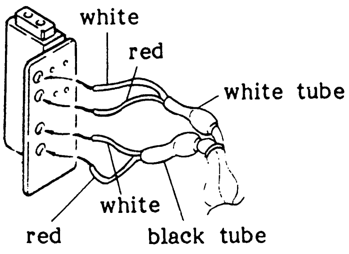
(ii) AU-76P Board

Turn RV101, RV110, RV201, and RV210 clockwise as far as they will go.


AT Head Block fixing screws
Adjusting Plate
AT Head Block
TG-3
Audio/TC Head Block
Audio Confidence Head Block


Audio Confidence Head fixing screws
AT Head Block
CF Head Bracket
Audio/TC Head Block
Audio Confidence Head
CF Shield Case

(Step 4)


white
red
white tube
white
red
black tube

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5-13. REPLACEMENT OF THE CTL HEAD

Mode: Unthreading end mode

Replacement procedure:

(1) Remove the fixing screw and step screw as shown in the figure, remove the CTL Head Block from the unit.

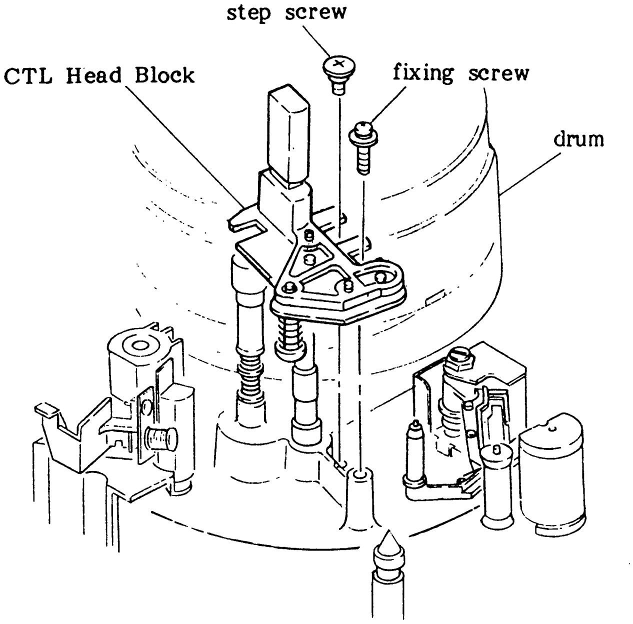
(2) Unsolder the two leads on the CH Board of the CTL Head.

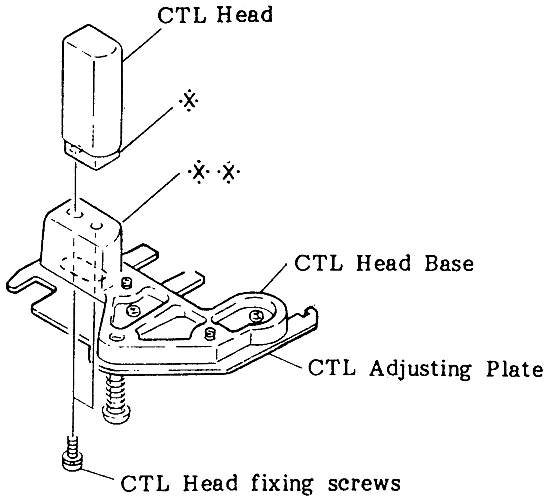
(3) Remove the two fixing screws from the CTL Head.

(4) Replace the CTL Head with a new one. (Install the new CTL Head so that the ※ marked portion of the CTL Head is parallel with the ※※ marked portion of the CTL Head Base.)

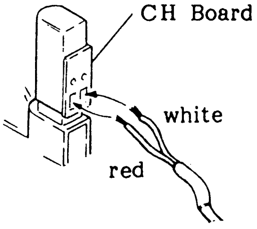
(5) Install the CTL Head in the reverse order of Steps (1) to (3).

(6) After replacement, perform the adjustments in Section 5-23.


step screw
CTL Head Block
fixing screw
drum


CTL Head
※
※ ※
CTL Head Base
CTL Adjusting Plate
CTL Head fixing screws

(Step 2)


CH Board
white
red

lead	CH board
red	CX
white	CY

5-14. REPLACEMENT OF THE FULL ERASE HEAD

Replacement procedure:

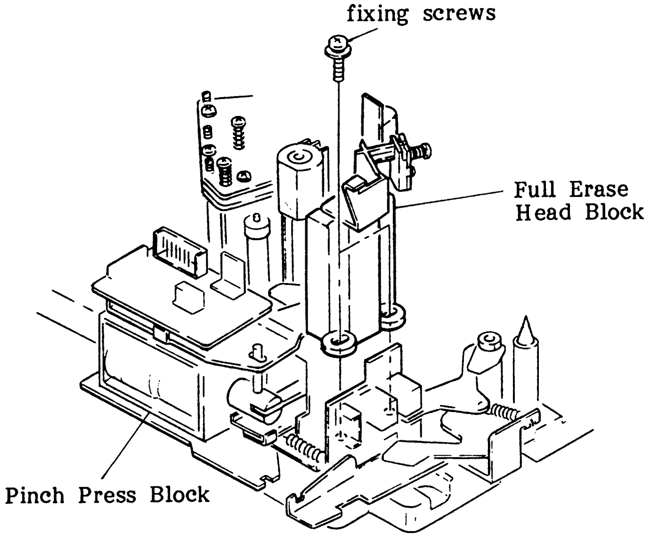
(1) Remove the two fixing screws as shown in the figure, then remove the Full Erase Head Block from the unit.

(2) Unsolder the two leads on the FE Board of the Full Erase Head.

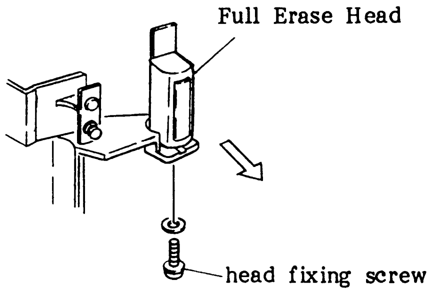
(3) Remove the fixing screw of the Full Erase Head in the lower portion.

(4) Install the new Full Erase Head while pushing the FE Base in the direction of the arrow.

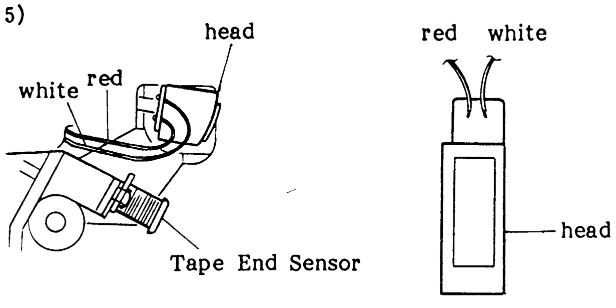
(5) Install the FE Head Block. Solder the two leads as shown in the figure.


fixing screws
Full Erase Head Block
Pinch Press Block

(Step 4)


Full Erase Head
head fixing screw

(Step 5)


head
white
red
Tape End Sensor
red
white
head

<Top view> <Front view>

5-15. REPLACEMENT OF THE TENSION REGULATOR BLOCK

Replacement procedure:

(1) Loosen the two fixing screws of the Gear Box, release the engagement of the Drive Gear and the Threading Ring.

(2) Turn the Threading Ring so that the Pinch Roller is placed in front of the Audio/TC Head.

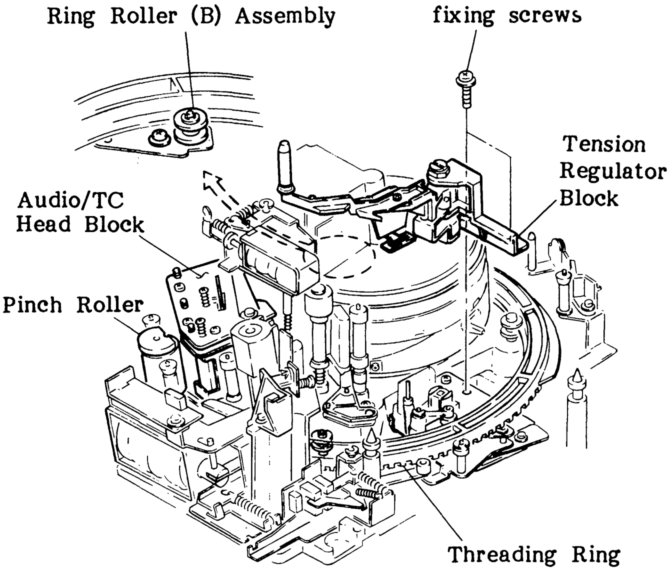
(3) Loosen the fixing screw of the Ring Roller (B), release the hold of the Threading Ring.

(4) Lightly lift the Threading Ring in front of the Supply Reel Table. Remove the two fixing screws of the Tension Regulator Block as shown in the figure.

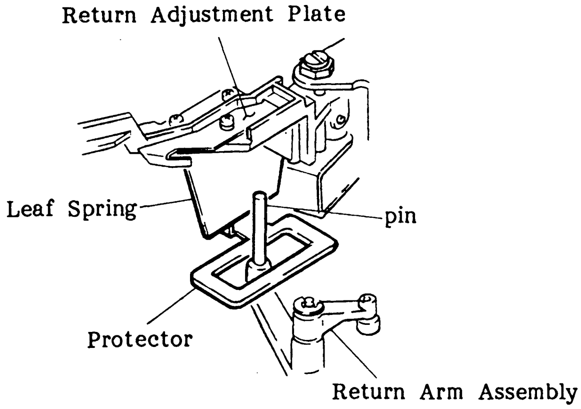
(5) Remove the Return Adjustment Plate, protector, and Leaf Spring from the old Tension Regulator Block. Install them in the new one.

(6) Install the Tension Regulator Block so that the pin of the Return Arm Ass'y is placed into the hole of the protector as shown in the figure.

(7) Tighten the Ring Roller (B) to the unit. After replacement, perform the adjustments in Section 5-23.


Ring Roller (B) Assembly
fixing screws
Tension Regulator Block
Audio/TC Head Block
Pinch Roller
Threading Ring

(Step 6)


Return Adjustment Plate
Leaf Spring
pin
Protector
Return Arm Assembly

5-16. REPLACEMENT OF THE SUPPLY TENSION ROLLER

Tool: Hex. key (across flat has 0.9 mm)

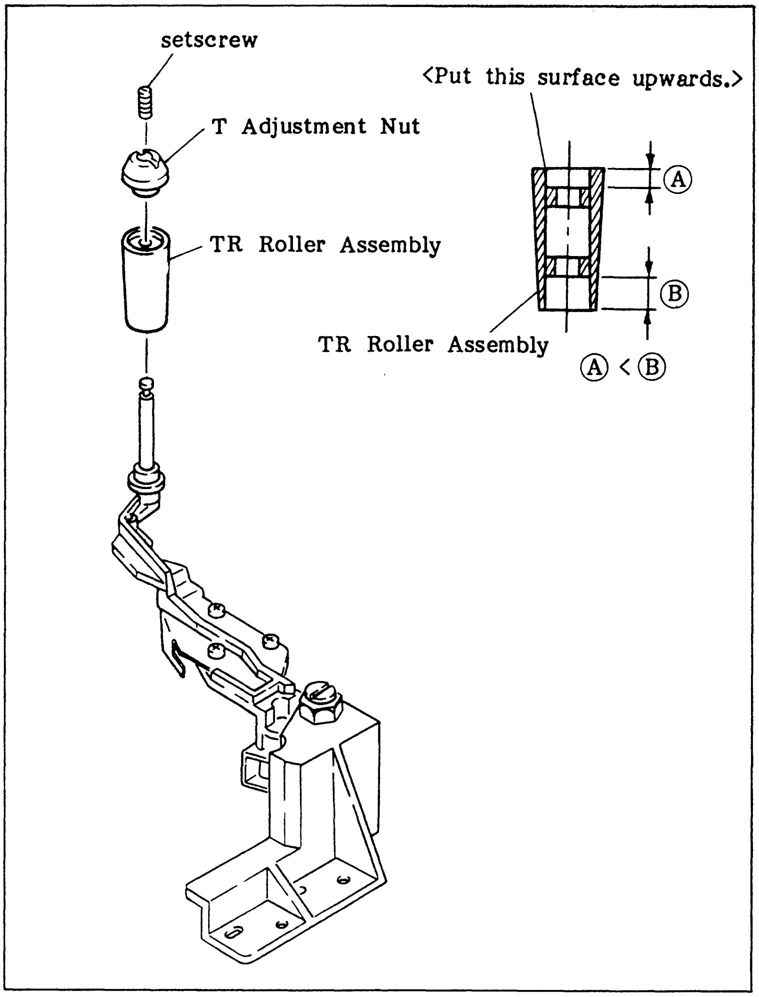
Replacement procedure:

(1) Remove the setscrew as shown in the figure.

(2) Turn the T Adjustment Nut, then remove it.

(3) Remove the TR Roller Ass'y, replace it with a new one.
NOTE: Before assembling the TR Roller Ass'y, put the TR Roller Ass'y in the direction as shown in the figure.

(4) After replacement, perform the adjustments in Section 5-23.


setscrew
<Put this surface upwards.>
T Adjustment Nut
Ⓐ
TR Roller Assembly
Ⓑ
TR Roller Assembly
Ⓐ < Ⓑ

5-17. REPLACEMENT OF THE PINCH SOLENOID

Replacement procedure:

(1) Remove the PD-35 Board from the Pinch Press Block.

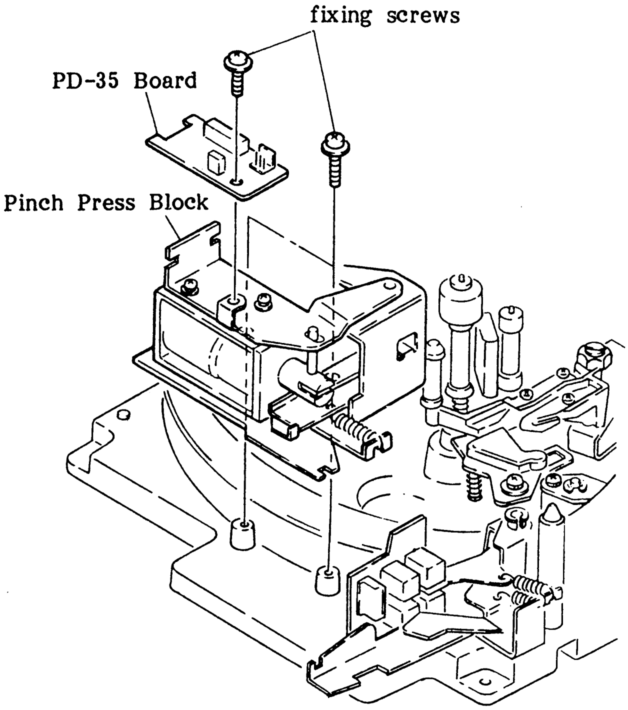
(2) Remove the Pinch Press Block from the unit.

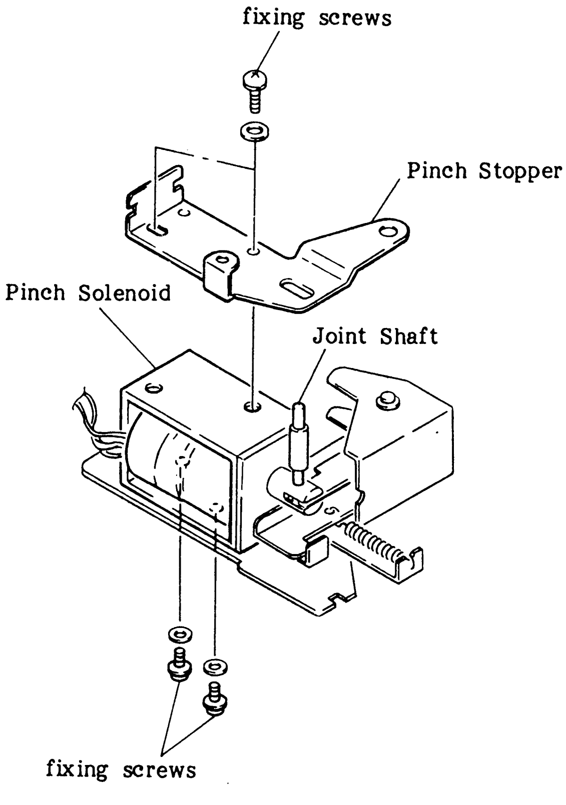
(3) Remove the two fixing screws as shown in the figure, remove the Pinch Stopper.

(4) Remove the Joint Shaft.

(5) Remove the two fixing screws. Remove the Pinch Solenoid, replace it with a new one.

(6) After replacement, perform the adjustments in Section 5-23.


fixing screws
PD-35 Board
Pinch Press Block


fixing screws
Pinch Stopper
Pinch Solenoid
Joint Shaft
fixing screws

5-18. REPLACEMENT OF THE THREADING MOTOR

Tool: Hex. key (across flat has 1.27 mm)

Replacement procedure:

(1) Disconnect connector CN702 on the SE-57 Board.

(2) Remove the two fixing screws, then remove the Gear Box from the unit.

(3) Remove the fixing screw of the Motor Pulley with a hex. key. Remove the pulley and the belt from the Gear Box.

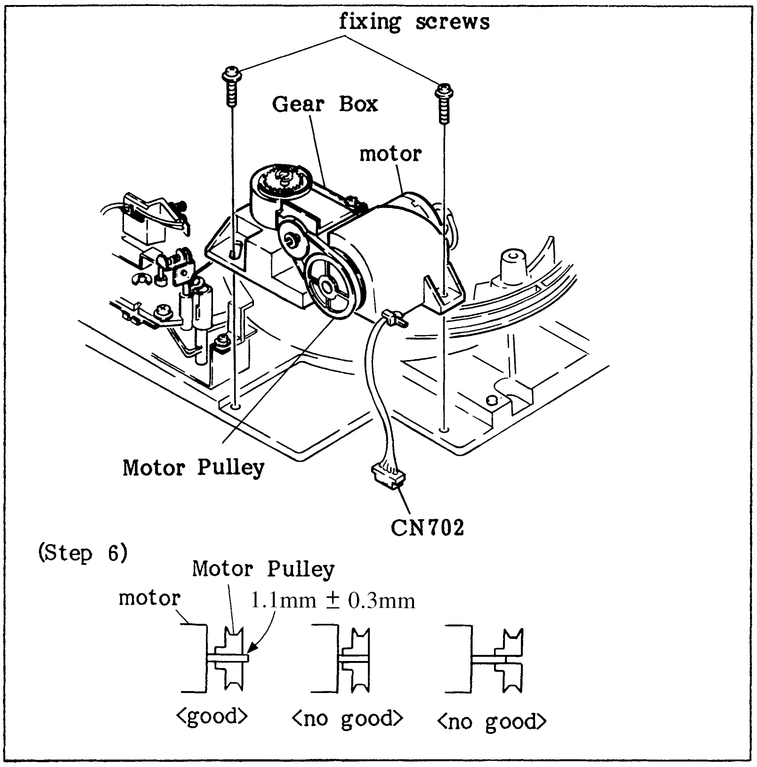
(4) Unsolder the two leads of the motor.

(5) Replace the motor with a new one. Solder the gray lead to the "+" terminal and the black lead to the other terminal.

(6) Install the Motor Pulley so that the end of the Motor Shaft and the Motor Pulley are as shown in the figure.

(7) Install the Gear Box into the unit. Connect connector CN702 on the SE-57 Board.

(8) Perform the adjustments in Section 5-23.


fixing screws
Gear Box
motor
Motor Pulley
CN702
(Step 6)
Motor Pulley
motor
1.1mm ± 0.3mm
<good>
<no good>
<no good>

5-19. REPLACEMENT OF THE PINCH ROLLER

Mode: Unthread end mode (Turn the power OFF.) Turn the Motor Pulley of the Gear Box about 5 turns so that the Threading Ring turns a little in the threading direction.

Replacement procedure:

(1) Remove the E ring on the Threading Ring as shown in the figure.

(2) As shown in the figure, hold the specified section of the Pinch Roller Block, and remove it gradually upward.

Note 1: Be sure not to remove the Pinch Roller Block by holding the Pinch Roller Rubber or the Pinch Arm Block.

Note 2: Be sure not to scratch the Pinch Arm Shaft.

(3) Moisten the cleaning piece with cleaning fluid, and clean the Pinch Arm Shaft.

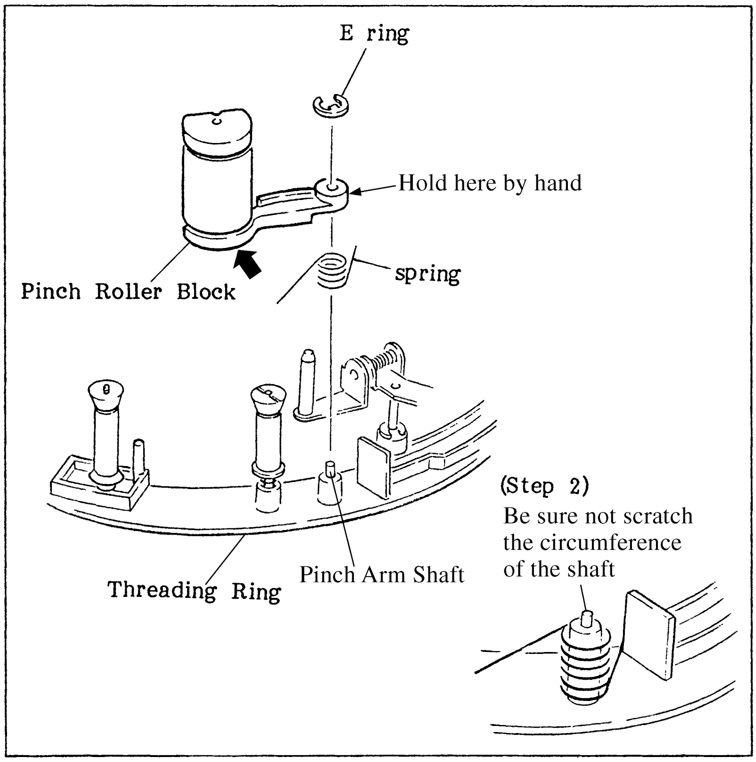
(4) Moisten a clean gauze with Sony Oil, and wipe the outer circumference of the Pinch Arm Shaft lightly.

(5) Hook the spring as shown in the figure, install the new Pinch Roller on the Threading Ring.

Note : Be sure not to scratch the Pinch Arm Shaft.

(6) After installing the E-ring, check that the Pinch Arm Assembly returns its specified position by means of the force of spring while pushing the Pinch Arm Assembly in the arrow direction several times with fingertip.

(7) After replacement, perform the adjustments in Section 5-23.


E ring
Hold here by hand
Pinch Roller Block
spring
Threading Ring
Pinch Arm Shaft
(Step 2)
Be sure not scratch the circumference of the shaft

5-20. REPLACEMENT OF THE THREADING RING

Replacement procedure:

(1) Turn the Gear Box Pulley by hand so that the Pinch Roller is in front of the Audio/TC Head.

(2) Remove the Pinch Retainer, Full Erase Head Block, Cleaning Roller Block, AT Head Block, Pinch Solenoid Block, and the Ring Sensor Block.

(3) Disconnect the connector on the Slip Ring Block.

(4) Loosen the fixing screws of the Gear Box, release the engagement of the Drive Gear and the Threading Ring.

(5) Loosen the fixing screw of the Ring Roller (B), release the hold of the Threading Ring.

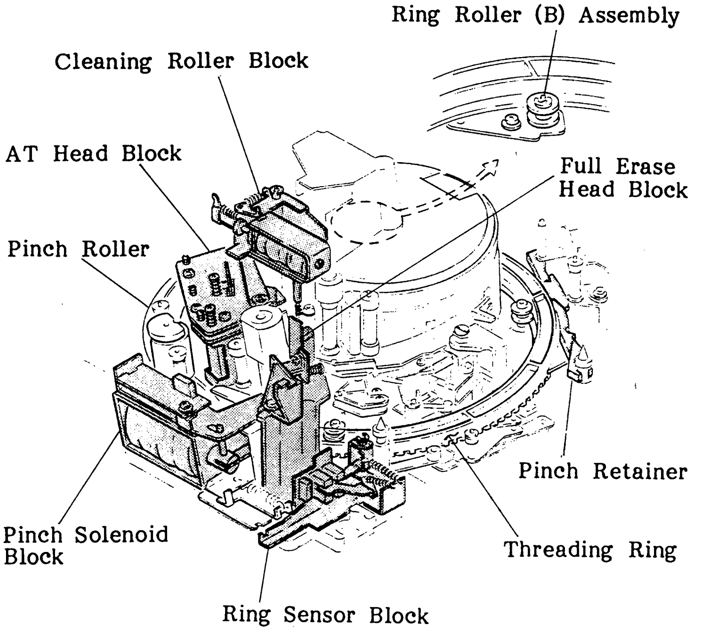
(6) Remove the Threading Ring, replace it with a new one.

(7) Install the Ring Sensor while turning in the counterclockwise direction.

(8) Install the Pinch Solenoid Block, AT Head Block, and Full Erase Head Block.

(9) Insert the connector on the Slip Ring Block.

(10) After replacement, perform the adjustments in Section 5-23.


Ring Roller (B) Assembly
Cleaning Roller Block
AT Head Block
Full Erase Head Block
Pinch Roller
Pinch Retainer
Pinch Solenoid Block
Threading Ring
Ring Sensor Block

5-21. REPLACEMENT OF THE CASSETTE-UP COMPARTMENT WORM GEAR

Tool: Hex. key (across flat has 1.27 mm)
DC power (12 V)
Wire clearance gauge

Replacement procedure:

(1) Remove the Cassette-up Compartment from the unit.

(2) Disconnect the connector on the CCM-2 Board of the Cassette-up Compartment Motor.

(3) Remove the Cassette-up Compartment Motor Block from the Cassette-up Compartment.

(4) Loosen the fixing screw of the Motor Joint on the Worm Gear Shaft side.

(5) Remove the motor.

(6) Remove the Worm Bracket, replace the defective parts with a new one.

(7) Install the Worm Bracket in the Cassette-up Compartment Motor Block so that the clearance between the Worm Holder and the Worm Washer meets the required specification.

(8) Insert the Motor Joint into the Worm Gear Shaft, then install it while pushing the Motor Joint in the direction of the Bracket.

(9) Insert the motor into the Bracket, engaged at two joints.

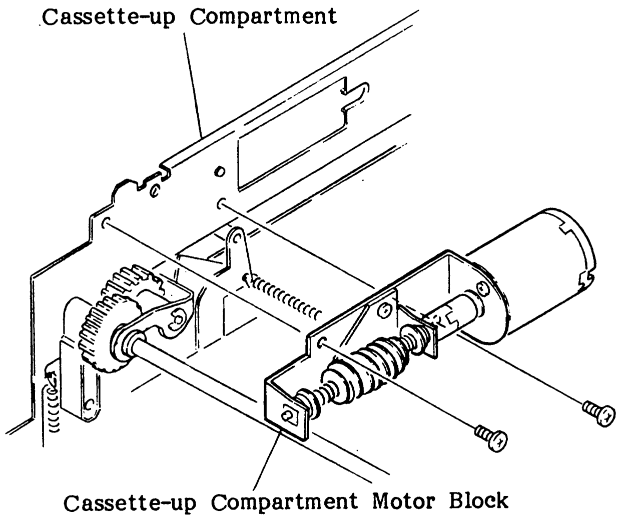
(10) Secure the motor to the Bracket.

(11) Remove the Motor Joint in the motor side so that the clearance between the two joints meets the required specification.

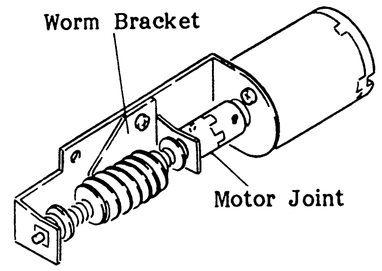
(12) Supply the 12VDC power to the connector on the CCM-2 Board of the Cassette-up Compartment Motor.

(13) Loosen the Worm Mounting Screw about 1/4 turn. Adjust the position of the Worm Bracket with a flatblade screwdriver (3 mm dia.) so that the current reading is minimized.

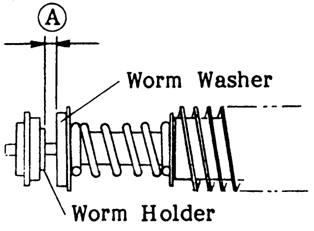
(14) Install the Cassette-up Compartment Motor Block to the Cassette-up Compartment Ass'y, connect the connector to the Cassette-up Compartment Motor.



(Step 4)

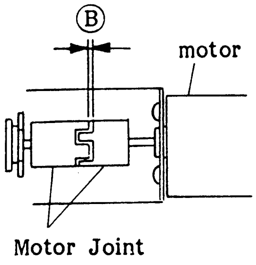


(Step 7)



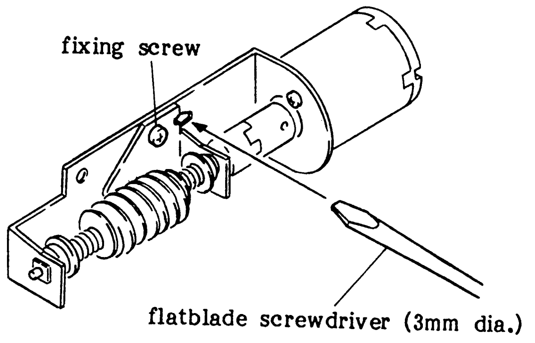
Spec.:
0.1mm≦ Ⓐ ≦0.3mm

(Step 11)



Spec.:
0.5mm≦ Ⓑ ≦0.8mm

(Step 13)


fixing screw
flatblade screwdriver (3mm dia.)

5-22. REPLACEMENT OF THE CASSETTE-UP COMPARTMENT MOTOR

Tool: Hex. key (across flat has 1.27 mm)
DC power (12 V)
Wire clearance gauge

Replacement procedure:

(1) Disconnect the connector on the CCM-2 Board of the Cassette-up Compartment Motor.

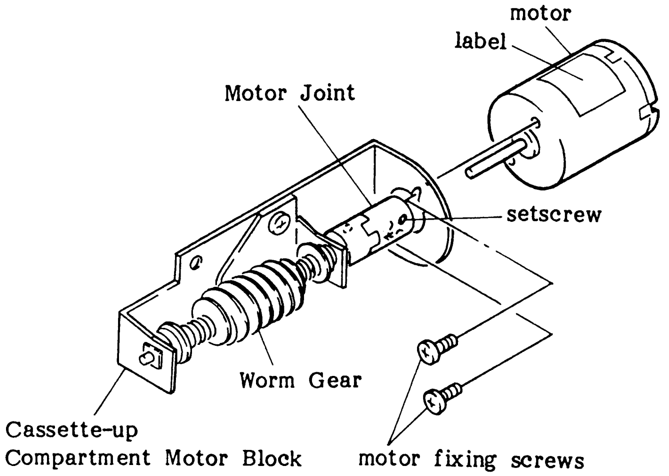
(2) Remove the Cassette-up Compartment Motor Block from the Cassette-up Compartment.

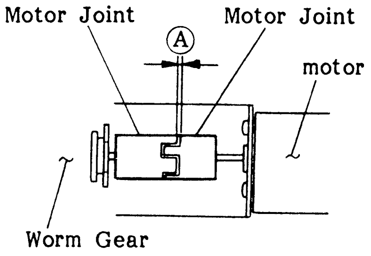
(3) Loosen the fixing screws of the motor, and then remove the motor.

(4) Thread the Motor Joint snugly but do not tighten to the shaft of the new motor, then insert the Motor Joint into the bracket. (Install it so that the label on the Motor is located as shown in the figure.)

(5) Adjust the position of the Motor Joint on the motor side so that the clearance between the Motor Joints on the Worm Gear side and the motor side meets the required specification.

(6) Install the Cassette-up Compartment Motor Block to the Cassette-up Compartment.


motor
label
Motor Joint
setscrew
Worm Gear
Cassette-up
Compartment Motor Block
motor fixing screws


Motor Joint
Motor Joint
Ⓐ
motor
Worm Gear

Spec.:
0.5mm≦ Ⓐ ≦0.8mm

5-23. ITEMS TO BE ADJUSTED AFTER MAIN PARTS REPLACEMENT

- Numbers in parenthesis refer to Section Nos.

Replacement of the Reel Motor

Reel Motor Shaft Slantness Adjustment (6-1-3) ⟶ Reel Table Height Adjustment (6-1-4) ⟶ Reel Rotation Detector Block Position Adjustment (6-1-5) ⟶ Reel Table Brake Clearance Adjustment (6-2-1) ⟶ Supply Brake Torque Adjustment (7-1-1) or Take-up Brake Torque Adjustment (7-1-2) ⟶ Reel Torque Adjustment (7-2) ⟶ Video Tracking Adjustment (Check) (8-1)

Replacement of the Reel Table

Reel Table Height Adjustment (6-1-4) ⟶ Reel Rotation Detector Block Position Adjustment (6-1-5) ⟶ Reel Table Brake Clearance Adjustment (6-2-1) ⟶ Supply Brake Torque Adjustment (7-1-1) or Take-up Brake Torque Adjustment (7-1-2) ⟶ Video Tracking Adjustment (Check) (8-1)

Replecement of the Motor Plate Assembly

Cassette Holder Height Adjustment (L) (6-1-1) ⟶ Cassette Holder Height Adjustment (S) (6-1-2) ⟶ Reel Table Height Adjustment (6-1-4) ⟶ Reel Rotation Detector Block Position Adjustment (6-1-5) ⟶ Reel Table Brake Clearance Adjustment (6-2-1) ⟶ Reel Table Brake Release Adjustment (6-2-2) ⟶ Supply Brake Torque Adjustment (7-1-1) ⟶ Take-up Brake Torque Adjustment (7-1-2) ⟶ Reel Torque Adjustment (7-2) ⟶ Video Tracking Adjustment (Check) (8-1)

Replacement of the Reel Table Brake

Reel Table Brake Clearance Adjustment (6-2-1) ⟶ Reel Table Brake Release Adjustment (6-2-2) ⟶ Supply Brake Torque Adjustment (7-1-1) or Take-up Brake Torque Adjustment (7-1-2)

Replacement of the Upper Drum

Slip Ring Block Brush Position Adjustment (8-6) ⟶ Video Tracking Adjustment (8-1) ⟶ CTL Head Position Adjustment (8-4-3) ⟶ Audio/TC Head Position Adjustment (8-2-5) ⟶ Cleaning Roller Position Adjustment (6-9) ⟶ R/P Head Y Switching Position Adjustment (10-14) ⟶ R/P Head C Switching Position Adjustment (10-15) ⟶ REC Drum Lock Phase Adjustment (10-16) ⟶ Picture Splitting Compensation Adjustment (10-17) ⟶ Video System Adjustment

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Replacement of the Drum Assembly

Slip Ring Block Brush Position Adjustment (8-6) → Video Tracking Adjustment (8-1) (Adjust as described in "Tracking Adjustment".) → CTL Head Position Adjustment (8-4-3) → Audio/TC Head Position Adjustment (8-2-5) → Cleaning Roller Position Adjustment (6-9) → R/P Head Y Switching Position Adjustment (10-14) → R/P Head C Switching Position Adjustment (10-15) → REC Drum Lock Phase Adjustment (10-16) → Picture Splitting Compensation Adjustment (10-17) → Video System Adjustment

Replacement of the Brush Assembly

Slip Ring Block Brush Position Adjustment (8-6)

Replacement of the Audio/TC Head Block

Audio/TC Head Zenith Adjustment (8-2-2) → Audio/TC Head Height Adjustment (8-2-1) → Audio/TC Head Azimuth Adjustment (8-2-3) → Audio/TC Head Phase Adjustment (8-2-4) → Video Tracking Adjustment (Check) (8-1) → Audio/TC Head Position Adjustment (8-2-5) → Audio Confidence Head Zenith Adjustment (8-3-2) → Audio Confidence Head Height Adjustment (8-3-1) → Audio Confidence Head Azimuth Adjustment (8-3-3) → Audio Confidence Head Phase Adjustment (8-3-4) → Audio System Adjustment → Time Code System Adjustment → Cleaning Roller Position Adjustment (6-9)

Replacement of the Audio Confidence Head

Audio Confidence Head Zenith Adjustment (8-3-2) → Audio Confidence Head Height Adjustment (8-3-1) → Audio Confidence Head Azimuth Adjustment (8-3-3) → Audio Confidence Head Phase Adjustment (8-3-4) → Audio/TC Head Zenith Adjustment (8-2-2) → Audio/TC Head Height Adjustment (8-2-1) → Audio/TC Head Azimuth Adjustment (8-2-3) → Audio/TC Head Phase Adjustment (8-2-4) → Video Tracking Adjustment (8-1) → Audio/TC Head Position Adjustment (8-2-5) → Audio System Adjustment → Cleaning Roller Position Adjustment (6-9)

Replacment of the CTL Head

CTL Head Azimuth/Zenith Adjustment (8-4-2) → CTL Head Height Adjustment (8-4-1) → Video Tracking Adjustment (8-1) → CTL Head Position Adjustment (8-4-3) → Audio/TC Head Position Adjustment (8-2-5)

Replacement of the Tension Regulator Block

Threading Ring Rotation Adjustment (6-4) → Gear Box position Adjustment (6-5) → Pinch Roller Press Block Position Adjustment (6-6) → Tension Regulator Arm Position Adjustment (6-3-1) → Tension Regulator Arm Slantness Adjustment (6-3-2) → Tension Sensor Position → Adjustment (6-7) → Tension Sensor Sensitivity Adjustment (6-8) → Video Tracking Adjustment (8-1) → Cleaning Roller Position Adjustment (6-9)

Replacement of the S Tension Roller

Video Tracking Adjustment (8-1)

Replacement of the Pinch Solenoid

Pinch Roller Press Block Position Adjustment (6-6)

Replacement of the Capstan Motor

Pinch Roller Press Block Position Adjustment (6-6) → Servo System Adjustment → Video Tracking Adjustment (8-1)

Replacement of the Threading Motor

Gear Box Position Adjustment (6-5)

Replacement of the Pinch Roller

Pinch Roller Press Block Position Adjustment (6-6) → Video Tracking Adjustment (8-1)

Replacement of the Threading Ring

Threading Rotation Adjustment (6-4) → Gear Box Position Adjustment (6-5) → Pinch Roller Press Block Position Adjustment (6-6) → Audio/TC Head Zenith Adjustment (8-2-2) → Audio/TC Head Height Adjustment (8-2-1) → Audio/TC Head Azimuth Adjustment (8-2-3) → Audio/TC Head Phase Adjustment (8-2-4) → Position Adjustment (8-2-5) → Audio confidence Head Zenith Adjustment (8-3-2) → Audio Confidence Head Height Adjustment (8-3-1) → Audio Confidence Head Azimuth Adjustment (8-3-3) → Audio Confidence Head Phase Adjustment (8-3-4) → Video Tracking Adjustment (8-1) → Cleaning Roller Position Adjustment (6-9)

SECTION 6
LINK AND DRIVE SYSTEM ALIGNMENT

ALIGNMENT INFORMATION

MODES

Unthreading end mode

This indicates the EJECT completion mode. At the time of ejection, the tension regulator arm and threading ring are completely returned to the cassette tape side.

Threading mode

When the STOP button is pressed, the threading ring rotates counterclockwise.

Threading end mode (STOP mode)

When the STOP button is pressed, the threading ring rotates counterclockwise, and the threading ring rotation is then stopped.

PLAY mode without a cassette tape

(1) Remove the Cassette-up Compartment (refer to Section 4-2).
(2) Set DIP switch S106 on the SY-61 Board to ON.
(3) Set System Setup *Item 902 to 1.
(At that time, message "Error" appears on the time counter display of the front panel. The unit is activated normally irrespective of its message.)
(4) When the STOP button is pressed, the threading ring rotates counterclockwise, and the threading ring rotation is stopped. The STANDBY lamp then lights, and the unit enters the STOP mode.
(5) When the PLAY button is pressed, the pinch roller is pressed against the capstan shaft, and the unit enters the PLAY mode.
(6) After adjustment is completed, set System Setup *Item 902 to 0.
(7) Set DIP switch S106 on the SY-61 Board to OFF.
(8) Install the Cassette-up Compartment.

STANDBY OFF mode without a cassette tape

(1) Put the unit into the STOP mode without a cassette tape (refer to Steps 1 through 4 described above).
(2) Press the STANDBY button after the STANDBY lamp lights.
The STANDBY lamp then goes off, and the unit enters the STANDBY OFF mode in which the drum rotation is stopped.
(3) After adjustment is completed, set System Setup *Item 902 to 0.
(4) Set DIP switch S106 on the SY-61 Board to OFF.
(5) Install the Cassette-up Compartment.

REV mode without tape

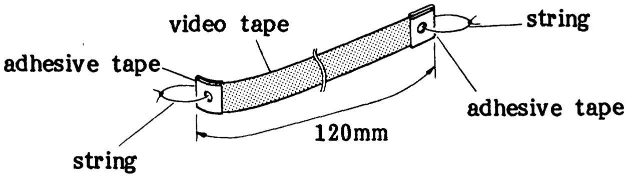
(1) Put the unit into the STOP mode without a cassette tape.
(2) Turn the search dial counterclockwise. The unit then enters the REV mode.
(3) After adjustment is completed, set System Setup *Item 902 to 0.
(4) Set DIP switch S106 on the SY-61 Board to OFF.
(5) Install the Cassette-up Compartment.

Creating the locally-produced-tape

(1) Prepare a 12cm-long video tape (used out tape is acceptable).

(2) As shown in the figure, attach adhesive tape across the video tape and make holes in it.

(3) Make a 10cm-long loop of string through the holes.


video tape
string
adhesive tape
adhesive tape
120mm
string

* Item 902

For setting, refer to the Setup in 1-7-1. To display this item, turn the SEARCH dial while pressing the PLAY button.

Note: Item 900 series are used only at the factory. Setting should not be thus changed. When setting is changed, be sure to return it to the initial value.

6-1. REEL TABLE SYSTEM ADJUSTMENT

6-1-1. Cassette Holder Height Adjustment (L)

Tool: Cassette reference plate (L)
Hex. key (across flat has 1.5 mm)
Thickness gauge

Mode: Unthreading end mode

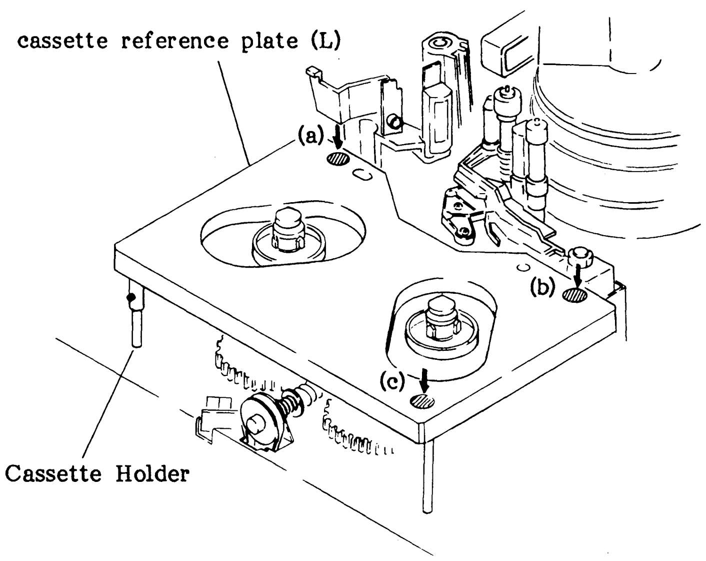
Check procedure:

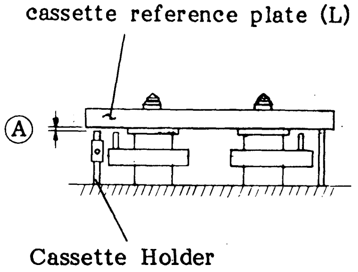
(1) Install the cassette reference plate (L) at the position for the cassette.

(2) While lightly pushing the cassette reference plate (L) marked (a), (b), and (c) toward the chassis, check that the clearance between the cassette reference plate (L) and the Cassette Holder meets the required specification.

Adjustment procedure:

(1) Adjust the height of the Cassette Holder to meet the required specification.


cassette reference plate (L)
(a)
(b)
(c)
Cassette Holder


cassette reference plate (L)
Ⓐ
Cassette Holder

Spec.:
Ⓐ = No clearance

6-1-2. Cassette Holder Height Adjustment (S)

- It is required that Section 6-1-1, Cassette Holder Height Adjustment (L) is completed before initiating this adjustment.

Tool: Cassette reference plate (L)
Hex. key (across flat has 1.5 mm)
Inspection mirror

Mode: Unthreading end mode

Check procedure:

(1) Install the cassette reference plate (L) at the position for the cassette.

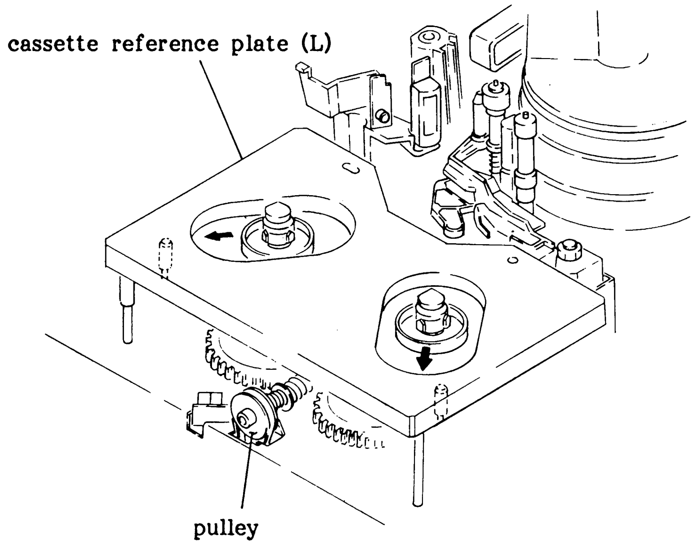
(2) Turn the pulley by hand so that the Reel Table moves to the position as shown in the figure.

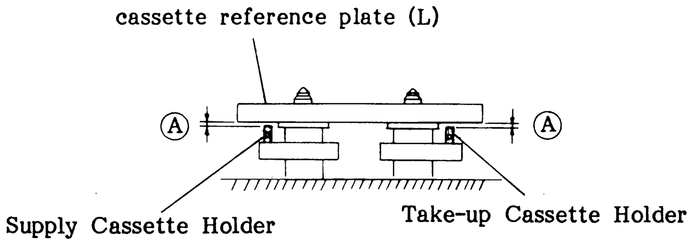
(3) Insert the cassette reference plate (L) in the Take-up Motor Plate Ass'y, check that there is no clearance between the Cassette Holder for the small cassette and the cassette reference plate (L).

(4) In the Supply Motor Plate Ass'y, check that there is no clearance between the Cassette Holder for the small cassette and the cassette reference plate (L).

Adjustment procedure:

(1) Adjust the height of the Cassette Holder so that there is no clearance between the cassette reference plate (L) and the Cassette Holder.


cassette reference plate (L)
pulley


cassette reference plate (L)
Ⓐ
Ⓐ
Supply Cassette Holder
Take-up Cassette Holder

Spec.:
Ⓐ = No clearance

6-1-3. Reel Motor Shaft Slantness Adjustment

- This adjustment is usually not required. Proceed with the following steps only when the Reel Motor is replaced.

Tool: Cassette reference plate (L)
Reel motor shaft slantness check gauge
Hex. key (across flat has 1.5 mm)
Thickness gauge

Mode: Unthreading end mode

Check procedure:

(1) Put the Reel Block into the L mode.

(2) Remove the Reel Table as described in replacement procedures (1) to (4) of Section 5-2, Replacement of the Reel Table. (Be careful not to lose the reel table height adjustment poly-slider washer.)

(3) Install the cassette reference plate (L) at the position for the cassette.

(4) Check that the clearance between the check gauge and the shaft meets the required specification, when the reel motor shaft slantness check gauge is set on the reel motor shaft from three directions as shown in the figure.

(5) Put the Reel Block into the S mode.

(6) Perform as described in procedure (4) again.

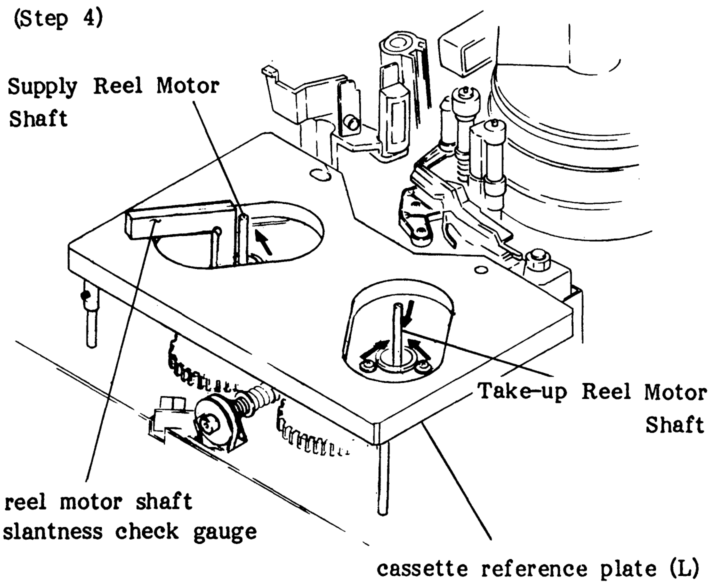
Adjustment procedure:

(1) Insert the reel motor spacer at the reel motor mounting screw as shown in the figure.

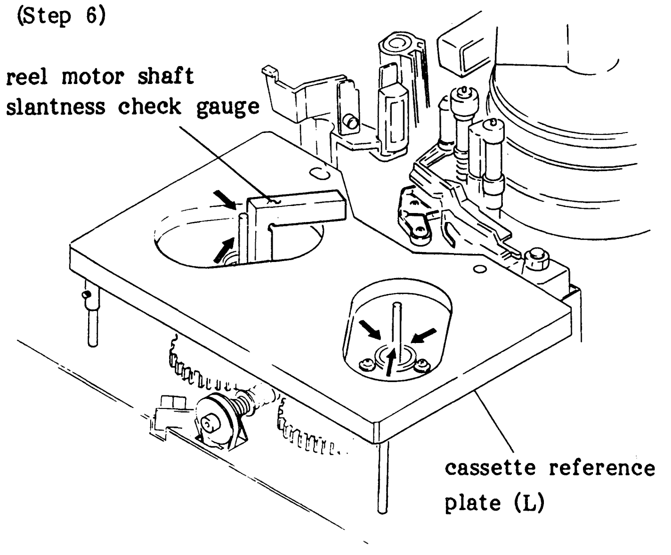
- **Reel motor spacer:** 3-717-625-01

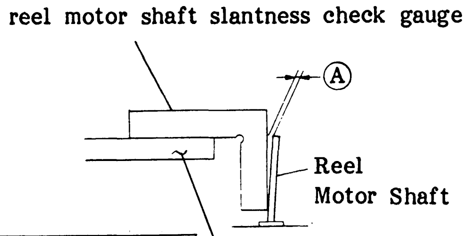
(2) After adjustment, install the Reel Table and perform Section 6-1-4, Reel Table Height Adjustment.

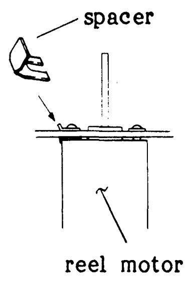
(Step 4)


Supply Reel Motor Shaft
Take-up Reel Motor Shaft
reel motor shaft slantness check gauge
cassette reference plate (L)

(Step 6)


reel motor shaft slantness check gauge
cassette reference plate (L)


reel motor shaft slantness check gauge
Ⓐ
Reel Motor Shaft
cassette reference plate (L)


spacer
reel motor

Spec.:
L mode Ⓐ ≦0.03mm
S mode Ⓐ ≦0.1mm

6-1-4. Reel Table Height Adjustment

- This adjustment is usually not required. Proceed with the following steps when the Reel Motor or Reel Table is replaced.

Tool: Cassette reference plate (L)
Reel table height gauge
Hex. key (across flat has 1.5 mm)

Mode: Unthreading end mode

Adjustment procedure:

(1) Put the Reel Block into the L mode.

(2) Install the cassette reference plate (L) at the position for the cassette.

(3) Move the reel table height gauge from three directions as shown in the figure. Adjust the height by changing the number of washers under the reel table so that the ※ marked portion of the gauge can slide over the Reel Table, while the ※※ marked portion is against and cannot slide over the Reel Table.

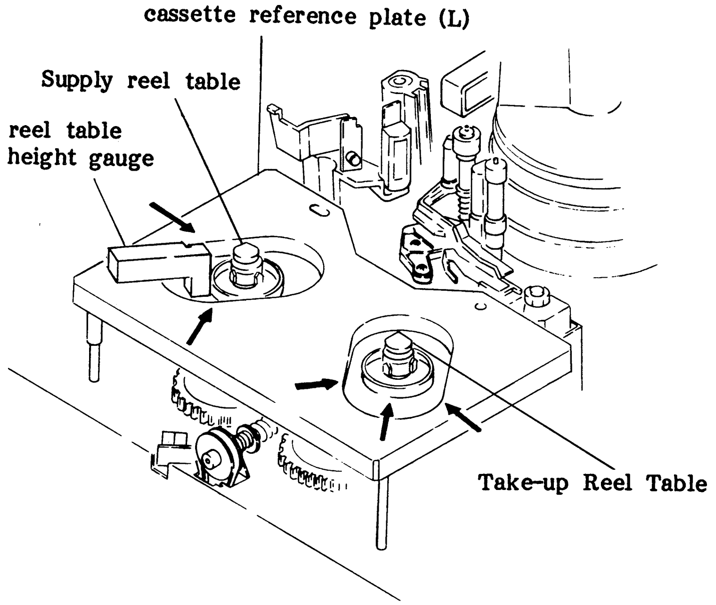
(4) Put the Reel Block into the S mode.

- **Adjustment washer:**

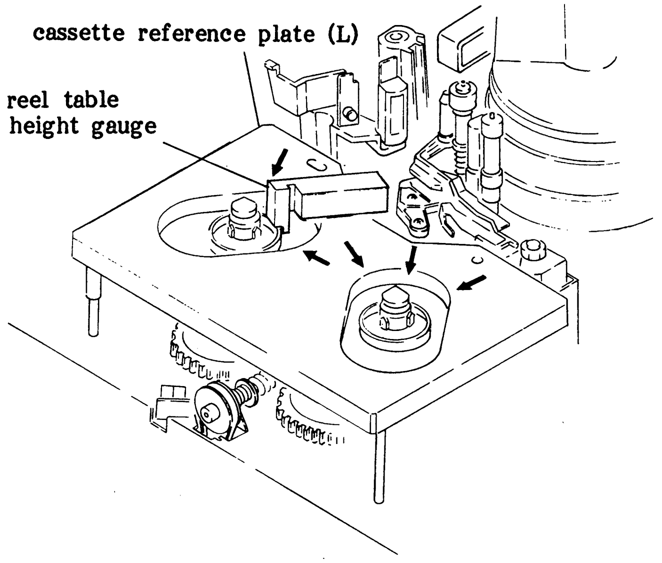
poly-slider washer, 4 mm dia.

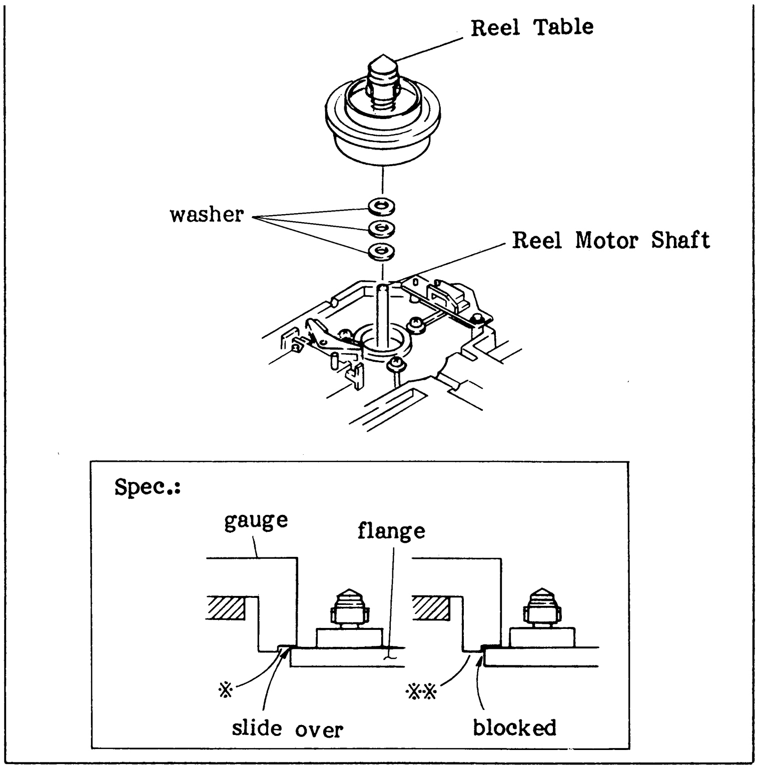
0.13 mm thick	3-701-441-01
0.25 mm thick	3-701-441-11
0.5 mm thick	3-701-441-21
0.05 mm thick	3-188-108-01

(Step 3)


cassette reference plate (L)
Supply reel table
reel table height gauge
Take-up Reel Table

(Step 4)


cassette reference plate (L)
reel table height gauge


Reel Table
washer
Reel Motor Shaft
Spec.:
gauge
flange
※
slide over
※※
blocked

6-1-5. Reel Table Rotation Detector Block Position Adjustment

Tool: Thickness gauge

Mode: Unthreading end mode (L or S mode)

Check procedure:

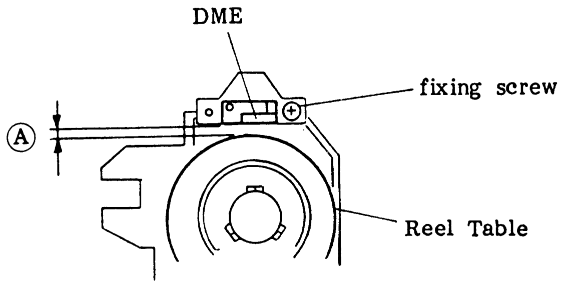
(1) Check that the clearance between the Take-up Reel Table/Supply Reel Table and the DME on the Reel Table Rotation Detector meets the required specification.

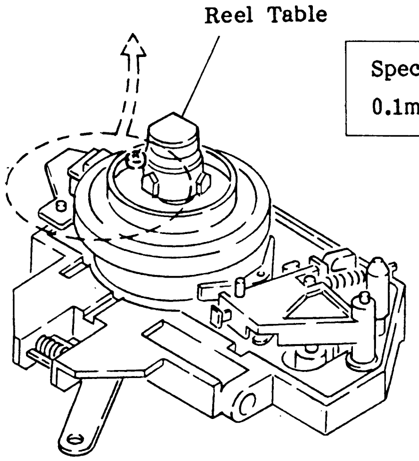
Adjustment procedure:

(1) Loosen the fixing screw of the Take-up Reel Table Rotation Detector Block.

(2) Adjust the position of the Reel Table Rotation Detector Block meets the required specification.

(3) Adjust the position of the Supply Reel Table Rotation Detector Block in the same way.


DME
fixing screw
Ⓐ
Reel Table



Spec.:
0.1mm≦ Ⓐ ≦0.2mm

6-2. BRAKE SYSTEM ADJUSTMENT

6-2-1. Reel Table Brake Clearance Adjustment

Check procedure:

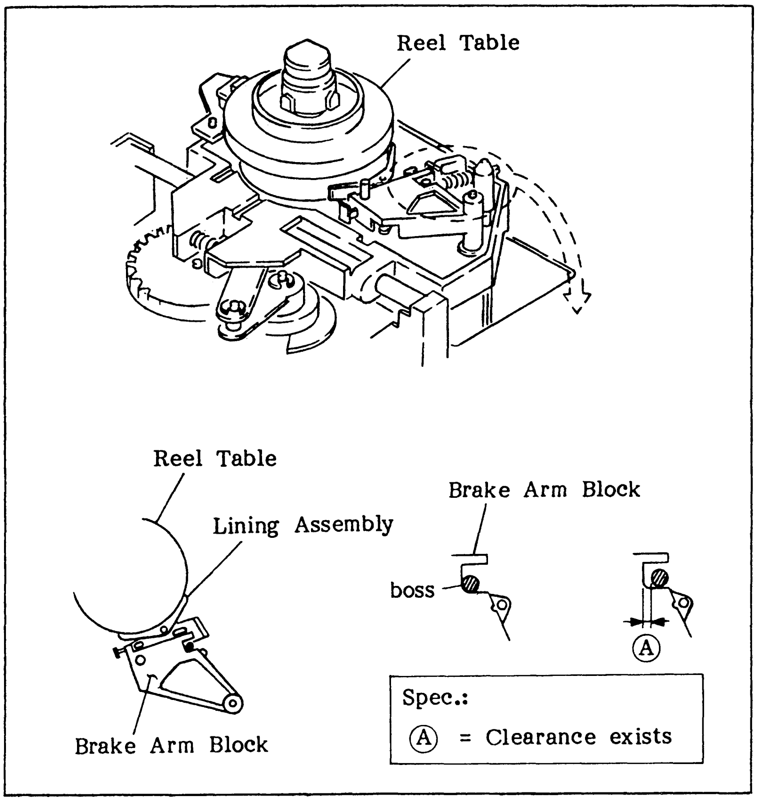
(1) When turning the Take-up Reel Table in the counterclockwise direction by hand, check that the clearance between the Brake Arm Block and the boss exists.

(2) When turning the Supply Reel Table in the clockwise direction, check that the clearance between the Brake Arm Block and the boss exists.

Adjustment procedure:

(1) Replace the Lining Ass'y as described in Section 5-6, Replacement of the Reel Table Brake.

(2) Check it again.



Spec.:
Ⓐ = Clearance exists

6-2-2. Reel Table Brake Release Adjustment

Mode: STOP mode (POWER ON)

Check procedure:

(1) Check that the Take-up Reel Lining does not touch the Take-up Reel Table during Take-up Reel Table rotation.

(2) Check that the Supply Reel Lining does not touch the Supply Reel Table during Supply Reel Table rotation.

Adjustment procedure:

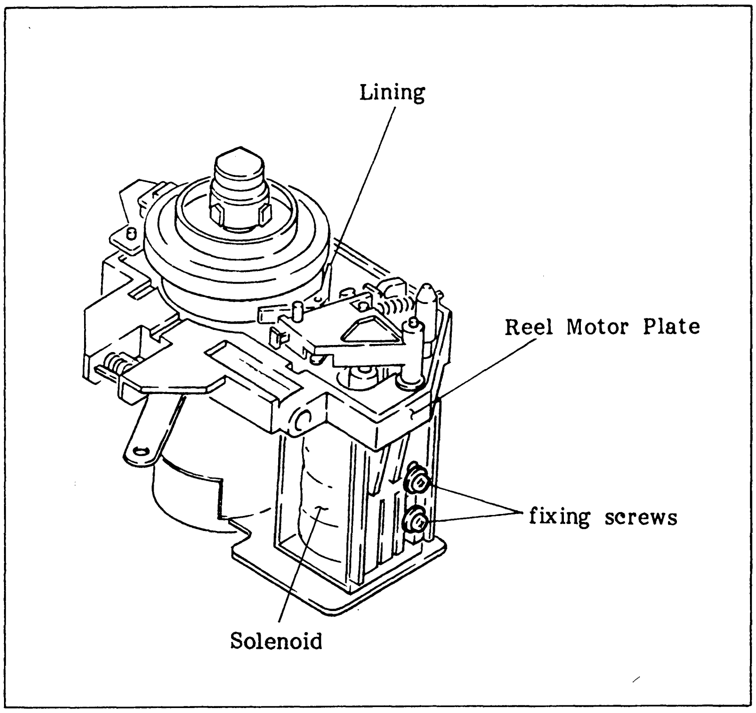
(1) Remove the Reel Motor Plate.

(2) Loosen the fixing screws of the solenoid.

(3) Lower the solenoid slight and secure it using the screws.

(4) Confirm according to the check procedure.

(5) Install the Reel Motor Plate and perform Section 6-1-2, Cassette Holder Height Adjustment (S); and 6-1-4, Reel Table Height Adjustment.



6-3. TENSION REGULATOR SYSTEM ADJUSTMENT

6-3-1. Tension Regulator Arm Position Adjustment

- This adjustment is closely related to the video tracking adjustment and the tension regulator arm slantness adjustment.
  After this adjustment, perform Section 8-1, Video Tracking Adjustment; and Section 6-3-2, Tension Regulator Arm Slantness Adjustment.

Tool: Tension scale (50 g full scale)
Wire clearance gauge
Locally-produced-tape
(Refer to "alignment information".)

Mode: Threading end mode without a cassette.
(Turn the power OFF.)

Check procedure:

(1) Install the locally-produced-tape as shown in the figure.

(2) Hook a tension scale to an end of the string. Pull out the tape in the direction of the arrow so that the scale reading is 45 g.

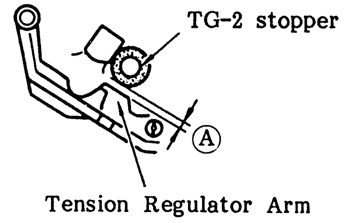
(3) When the scale reading is 45 g, check that the clearance between the stopper of the Tape Guide (2) and the Tension Regulator Arm meets the required specification.

Adjustment procedure:

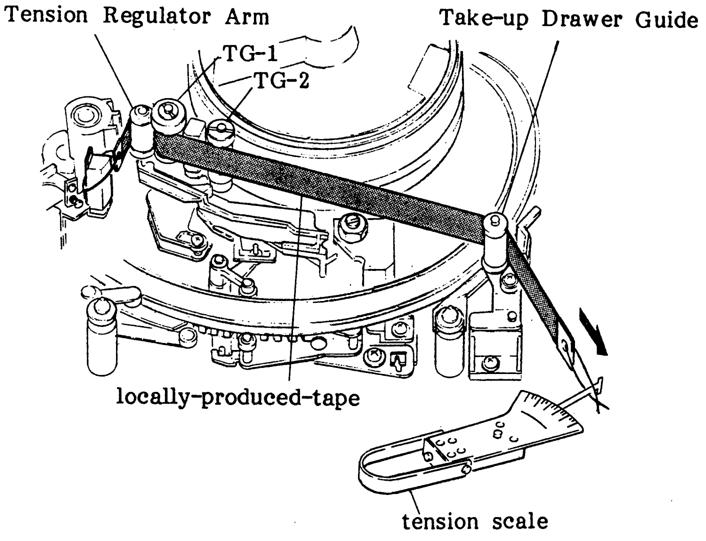
(1) Loosen the fixing screw of the Hook Adjustment Plate 1/4 to 1/2 turn.

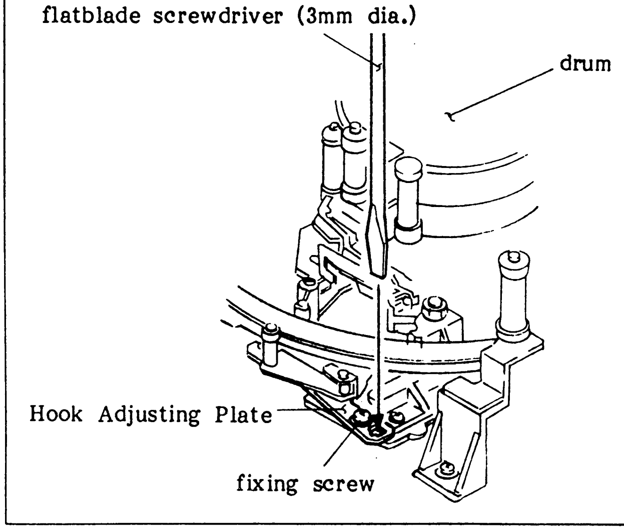
(2) Insert a flatblade screwdriver (3 mm dia.) into the adjusting hole as shown in the figure, then adjust it to meet the required specification.

(3) After adjustment, check as described in the check procedures.


TG-2 stopper
Ⓐ
Tension Regulator Arm

Spec.:
Ⓐ = 1.4 ± 0.2mm


Tension Regulator Arm
Take-up Drawer Guide
TG-1
TG-2
locally-produced-tape
tension scale


flatblade screwdriver (3mm dia.)
drum
Hook Adjusting Plate
fixing screw

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6-3-2. Tension Regulator Arm Slantness Adjustment

- This adjustment is closely related to the video tracking adjustment.
- After this adjustment, perform Section 8-1, Video Tracking Adjustment.

Tool: Cassette reference plate (L)
Tension regulator slantness check tool

Mode: Threading end mode

Check procedure:

(1) Open the RP-29P Boards Block.

(2) Install the cassette reference plate (L) into the cassette position.

(3) Place the tension regulator slantness check tool against the Tension Regulator Roller. Check that the slantness of the roller meets the required specification viewed from the direction of arrows A and B as shown in the figure.

Adjustment procedure:

- When the slantness is out of spec. (placed from the direction of arrow A).

(1) Loosen the fixing screw 1/2 to 1 turn.

(2) Adjust the slantness with the adjustment screws (A) and (B).

(3) Tighten the fixing screw and check again.

(4) After adjustment, perform the Step (8).

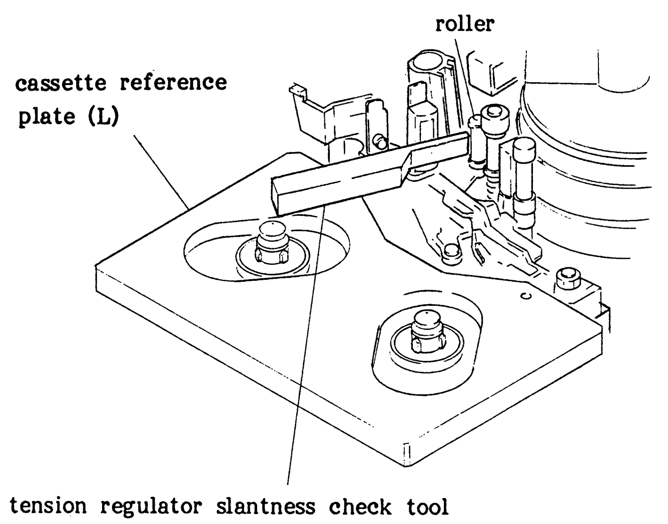
- When the slantness is out of spec. (placed from the direction of arrow B).

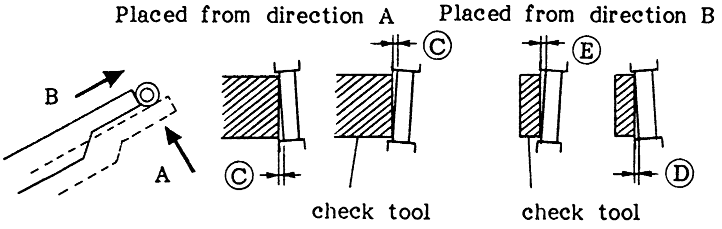
(5) Loosen the fixing screw 1/2 to 1 turn.

(6) Adjust the slantness with the adjustment screw (B).

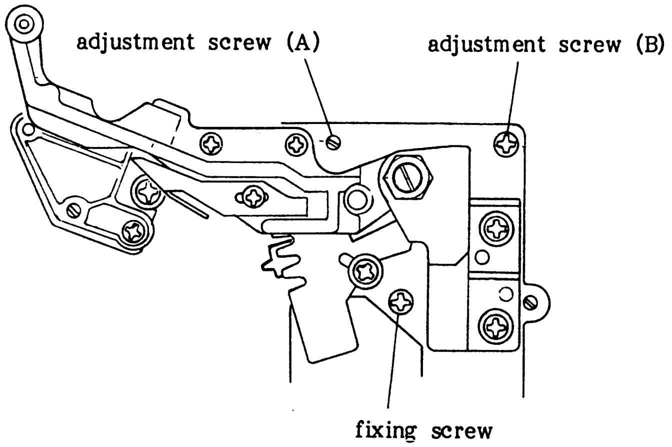
(7) Tighten the fixing screw and check again.

(8) After adjustment, perform Section 6-3-1, Tension Regulator Arm Position Adjustment; Section 8-1, Video Tracking Adjustment.


roller
cassette reference plate (L)
tension regulator slantness check tool


Placed from direction A
Placed from direction B
B
A
Ⓒ
Ⓒ
Ⓔ
Ⓓ
check tool
check tool

Spec.:
Ⓒ ≦ 0.05mm
0.25mm≦ Ⓓ ≦0.35mm
Ⓔ = No clearance


adjustment screw (A)
adjustment screw (B)
fixing screw

6-4. THREADING RING ROTATION ADJUSTMENT

- This adjustment is required only when the Threading Ring or Ring Roller (B) Ass'y is replaced or removed.

Mode: Turn the power OFF while rotating the Threading Ring 180 degrees from unthreading end state.

Check procedure:

(1) Open the RP-29P Boards Block.

(2) Check that the horizontal play meets the required specification when the Threading Ring is pushed in the direction of the arrow by hand.

(3) Check that the rotation of the Threading Ring into the threading and unthreading modes is smooth.

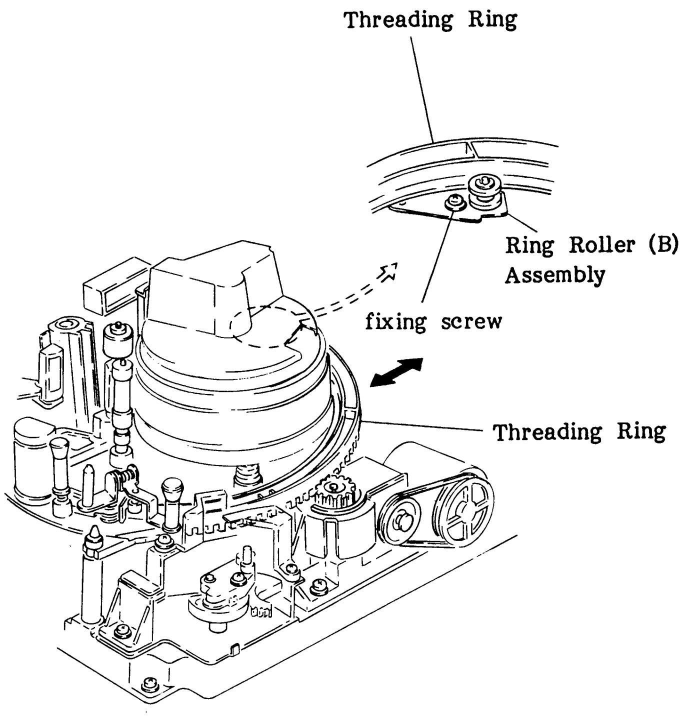
Adjustment procedure:

(1) Loosen the fixing screw of the Ring Roller (B) Ass'y 1/2 to 1 turn.

(2) Adjust the position of the Ring Roller (B) Ass'y to meet the required specification.

Adjusting procedure:

- Insert a 0.3 mm thick piece of paper between the Threading Ring and the Ring Roller.
- The paper of this manual is about 0.1 mm thick so that three pages are 0.3 mm thick.



6-5. GEAR BOX POSITION ADJUSTMENT

- It is required that Section 6-4, Threading Ring Rotation Adjustment is correct before initiating this adjustment.

Tool: Wire clearance gauge

Mode: Unthreading end mode

Check procedure:

(1) Open the RP-29P Boards Block.

(2) Turn the pulley of the Gear Box by hand about 90 degrees in the direction of the arrow.

(3) When pushing the Threading Ring in the direction of arrow (B) by hand, check that the clearance between the Threading Ring and the Drive Gear of the Gear Box meets the required specification with the wire clearance gauge.

Adjustment procedure:

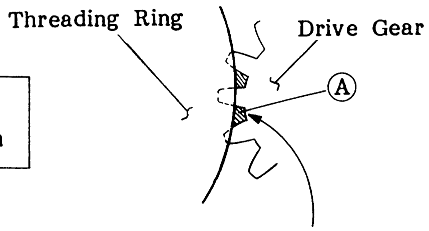
(1) Loosen the fixing screws of the Gear Box 1 to 2 turns.

(2) Press the Threading Ring in the direction of arrow (A), while lightly pushing the Drive Gear of the Gear Box against the Threading Ring.

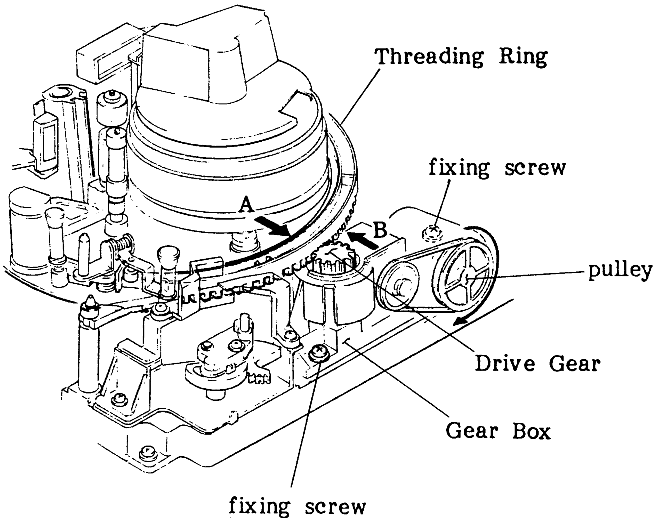
(3) Tighten the fixing screws of the Gear Box.

(4) After adjustment, check as described in the check procedures.

Spec.:
0.3mm≤ Ⓐ ≤0.5mm



Using a wire clearance gauge, measure clearance Ⓐ.



6-6. PINCH ROLLER PRESS BLOCK POSITION ADJUSTMENT

Mode: Threading end mode

Check procedure:

(1) Open the RP-29P Boards Block.

(2) Move the iron core of the Pinch Solenoid to the fully energized position in the direction of the arrow.

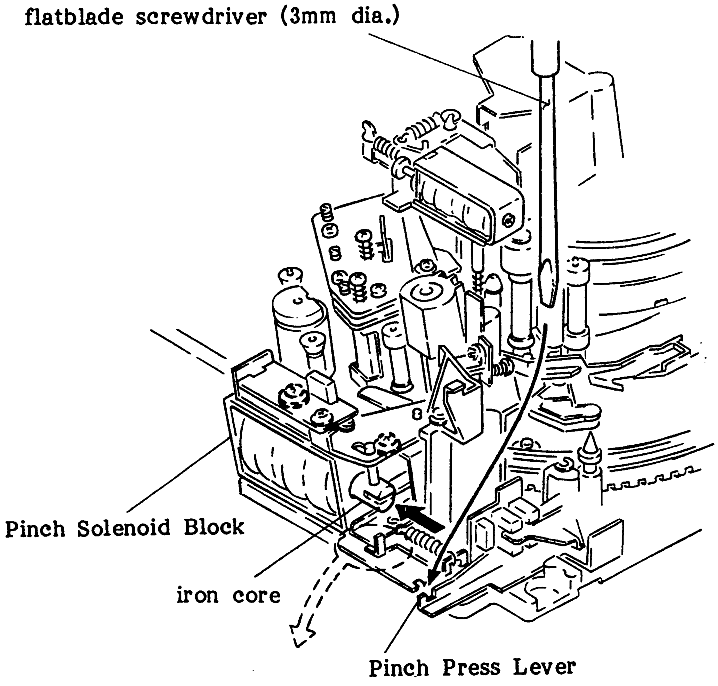
(3) Check that the clearance between the Pinch Press Lever and the Pinch Limiter meets the required specification.

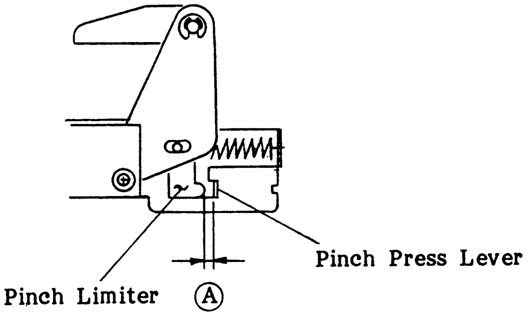
Adjustment procedure:

(1) Loosen the two fixing screws of the Pinch Solenoid Block 1/4 to 1/2 turn.

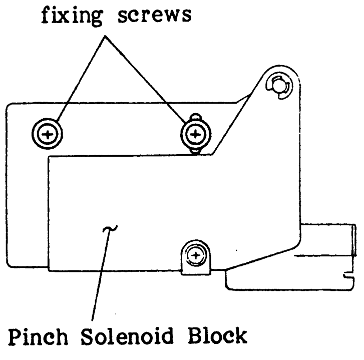
(2) Insert a flatblade screwdriver (3 mm dia.) into the adjusting hole of the Pinch Solenoid Block, then adjust the position of the Pinch Solenoid Block to meet the required specification.

(3) Tighten the two fixing screws, check as described in the check procedures.


flatblade screwdriver (3mm dia.)
Pinch Solenoid Block
iron core
Pinch Press Lever


Pinch Press Lever
Pinch Limiter
Ⓐ

Spec.:
Ⓐ = 0.7 ± 0.1mm


fixing screws
Pinch Solenoid Block

6-7. TENSION SENSOR POSITION ADJUSTMENT

Tool: Digital multimeter
Tension scale (50 g full scale)
Locally-produced-tape
(Refer to "alignment information".)

Mode: STANDBY OFF mode without a cassette tape

Preparation:

(1) Extend the SV-83A Board with an Extension Board.

(2) Connect the digital multimeter to TP3 on the SV-83A Board.

Check procedure:

(1) Install the locally-produced-tape as shown in the figure.

(2) Hook a tension scale to an end of the string. Pull the tape in the direction of the arrow so that scale reading is 45 g.

(3) When the scale reading is 45 g, check that the reading of the digital multimeter meets the required specification.

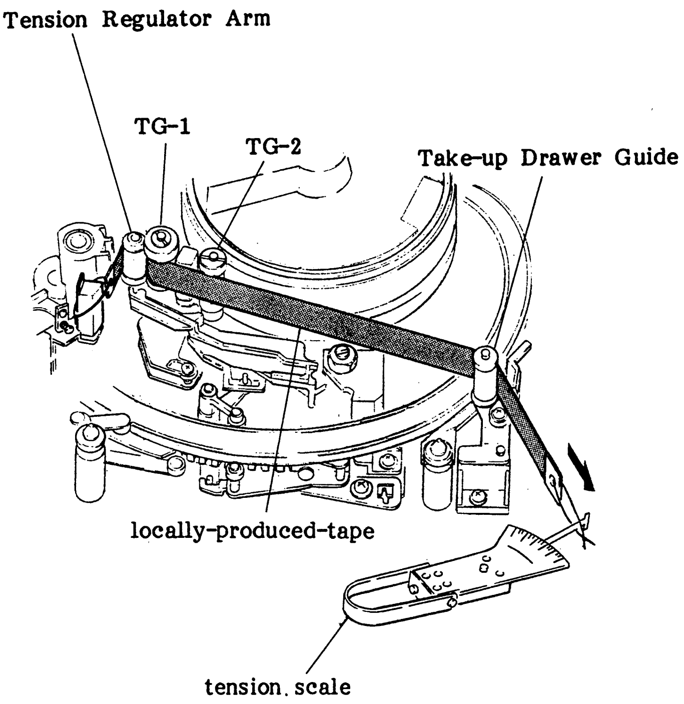
Adjustment procedure:

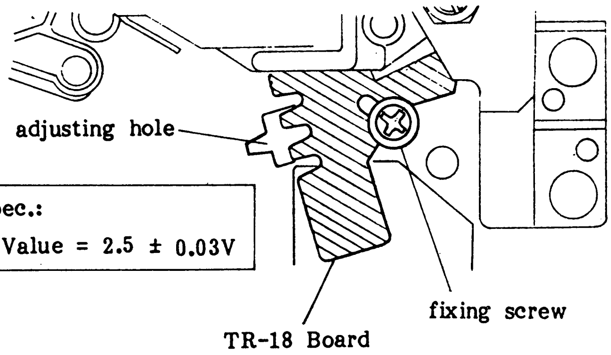
(1) Loosen the fixing screw of the TR-18 Board about 1/4 to 1/2 turn.

(2) Insert a flatblade screwdriver (3 mm dia.) into the adjustment hole, then adjust the position of the TR-18 Board to meet the required specification.

(3) Tighten the fixing screw, check that it meets the required specification again.

(4) After adjustment, perform Section 6-8, Tension Sensor Sensitivity Adjustment.

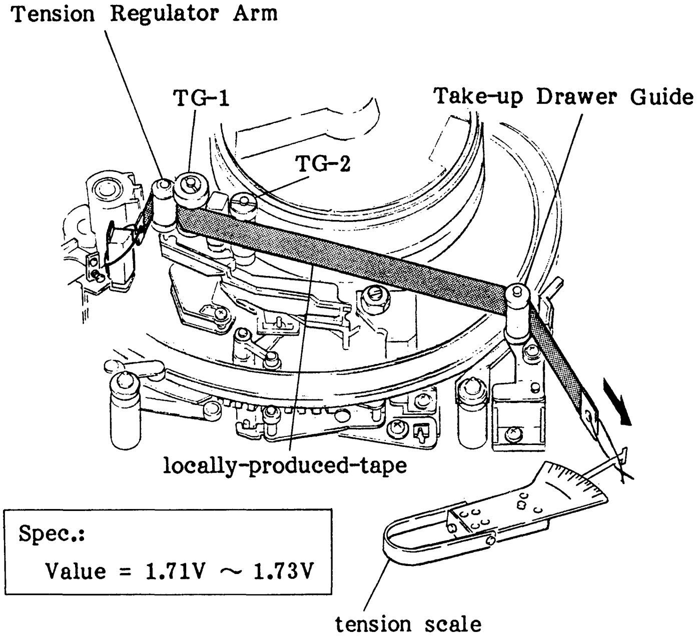

Tension Regulator Arm
TG-1
TG-2
Take-up Drawer Guide
locally-produced-tape
tension. scale


adjusting hole
fixing screw
TR-18 Board

Spec.:
Value = 2.5 ± 0.03V

6-8. TENSION SENSOR SENSITIVITY ADJUSTMENT

- It is required that Section 6-7, Tension Sensor Position Adjustment is correct before initiating this adjustment.



Spec.:
Value = 1.71V ~ 1.73V

Tool: Digital multimeter
Tension scale (50 g full scale)
Locally-produced-tape
(Refer to "alignment information".)

Mode: STANDBY OFF mode without a cassette tape

Preparation:

(1) Extend the SV-83A Board with an Extension Board.

(2) Connect the digital multimeter to TP3 on the SV-83A Board.

Check procedure:

(1) Install a locally-produced-tape as shown in the figure.

(2) Hook a tension scale to an end of the string. Pull the tape in the direction of the arrow so that scale reading is 25 g.

(3) When the scale reading is 25 g, check that the reading of the digital multimeter meets the required specification.

Adjustment procedure:

(1) Adjust RV3 on the SV-83A Board to meet the required specification.

(2) After adjustment, check that it meets the required specification again.

6-9. CLEANING ROLLER POSITION ADJUSTMENT

Mode: Unthreading end mode

Check procedure:

(1) Turn the power ON, short between TP-1 on the PD-35 Board and the chassis with a shorting clip.

(2) Check that the clearance between the Cleaning Roller Block Pin and the bracket meets the required specification.

(3) Insert the cassette tape in F.FWD mode. Check that the clearance between the pin and the bracket meets the required specification.

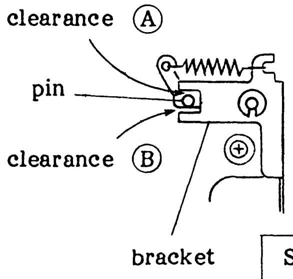
(4) If the specification is met, remove the shorting clip. (If the shorting clip is shorting for a long time, the internal fuse of the Cleaning Roller Solenoid will be blown.)

Adjustment procedure:

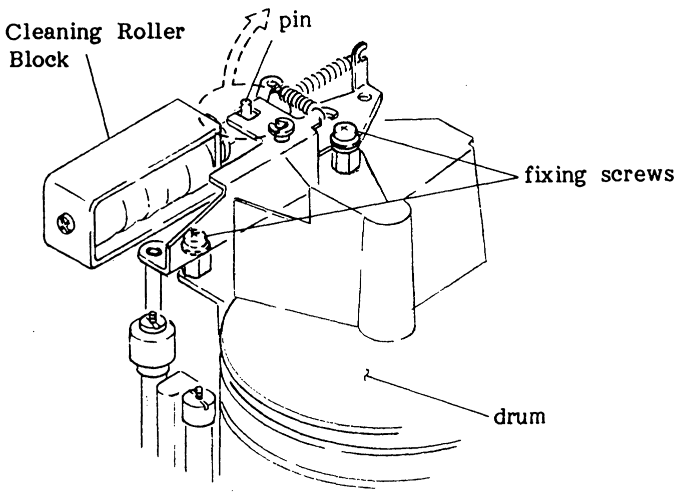
(1) Loosen the two fixing screws of the Cleaning Roller Block and adjust the position to meet the required specification as described in procedure (1).

(2) Check as described in the check procedure (3).

(3) Remove the shorting clip.



Spec.:
Clearances Ⓐ and Ⓑ exist



SECTION 7
TORQUE ALIGNMENT

ALIGNMENT INFORMATION

MODES

Unthreading end mode

This indicates the EJECT completion mode. At the time of ejection, the tension regulator arm and threading ring are completely returned to the cassette tape side.

Treading mode

When the STOP button is pressed, the threading ring rotates counterclockwise.

Threading end mode (STOP mode)

When the STOP button is pressed, the threading ring rotates counterclockwise, and the threading ring rotation is then stopped.

PLAY mode without a cassette tape

(1) Remove the Cassette-up Compartment (refer to Section 4-2).
(2) Set DIP switch S106 on the SY-61 Board to ON.
(3) Set System Setup *Item 902 to 1.
(At that time, message "Error" appears on the time counter display of the front panel. The unit is activated normally irrespective of its message.)
(4) When the STOP button is pressed, the threading ring rotates counterclockwise, and the threading ring rotation is stopped. The STANDBY lamp then lights, and the unit enters the STOP mode.
(5) When the PLAY button is pressed, the pinch roller is pressed against the capstan shaft, and the unit enters the PLAY mode.
(6) After adjustment is completed, set System Setup *Item 902 to 0.
(7) Set DIP switch S106 on the SY-61 Board to OFF.
(8) Install the Cassette-up Compartment.

STANDBY OFF mode without a cassette tape

(1) Put the unit into the STOP mode without a cassette tape (refer to Steps 1 through 4 described above).
(2) Press the STANDBY button after the STANDBY lamp lights.
The STANDBY lamp then goes off, and the unit enters the STANDBY OFF mode in which the drum rotation is stopped.
(3) After adjustment is completed, set System Setup *Item 902 to 0.
(4) Set DIP switch S106 on the SY-61 Board to OFF.
(5) Install the Cassette-up Compartment.

REV mode without a cassette tape

(1) Put the set into the STOP mode without a cassette tape.

(2) Turn the search dial counterclockwise. The unit then enters the REV mode.

(3) After adjustment is completed, set System Setup *Item 902 to 0.

(4) Set DIP switch S106 on the SY-61 Board to OFF.

(5) Install the Cassette-up Compartment.

* Item 902

For setting, refer to the Setup in 1-7-1. To display this item, turn the SEARCH dial while pressing the PLAY button.

Note: Item 900 series are used only at the factory. Setting should not be thus changed. When setting is changed, be sure to return it to the initial value.

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7-1. BRAKE TORQUE CHECK

7-1-1. S Brake Torque Check

Tool: Reel table tension gauge
Tension scale (100 g full scale)

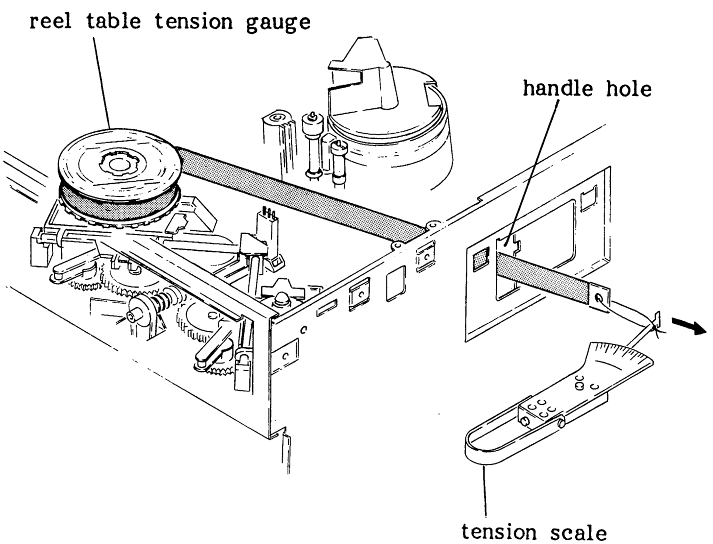
Mode: Threading end mode

Preparation:

(1) Remove the handle on the right side.
(2) Open the RP-29P Boards Block.
(3) Remove the Tape Beginning Sensor.

Check procedure:

(1) Wind the tape to the reel table tension gauge in the clockwise direction.
(2) Install the reel table tension gauge on the Supply Reel Table. Pass the end of the tape out for the unit from the hole of the handle.
(3) Hook a tension scale to an end of the string. Move the tension scale in the direction of the arrow, check that the scale reading meets the required specification.



Spec.:
54g ～ 81g (scale value)
(200g.cm ～ 300g.cm)

7-1-2. T Brake Torque Check

Tool: Reel table tension gauge
Tension scale (100 g full scale)

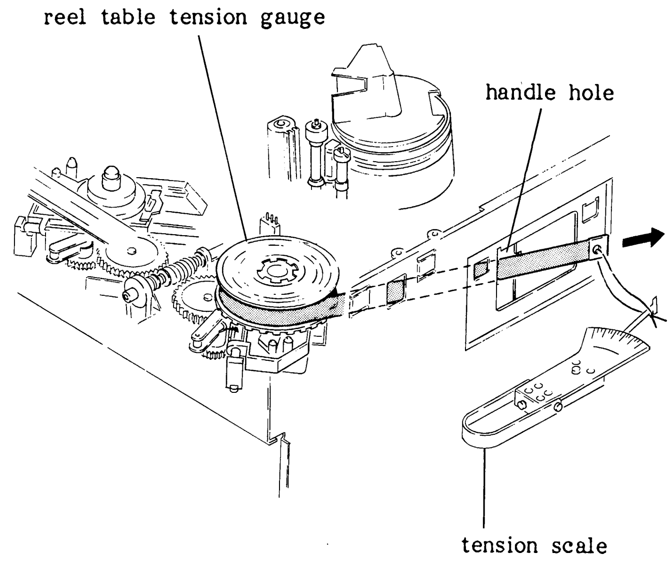
Mode: Threading end mode

Preparation:

(1) Remove the handle on the right side.
(2) Open the RP-29P Boards Block.
(3) Remove the Tape Beginning Sensor.

Check procedure:

(1) Wind the tape to the reel table tension gauge in the counterclockwise direction.
(2) Install the reel table tension gauge on the Take-up Reel Table. Pass the end of the tape out for the unit from the hole of the handle.
(3) Hook a tension scale to an end of the string. Move the tension scale in the direction of the arrow, check that the scale reading meets the required specification.



Spec.:
54g ～ 81g (scale value)
(200g.cm ～ 300g.cm)

7-2. REEL TORQUE ADJUSTMENT

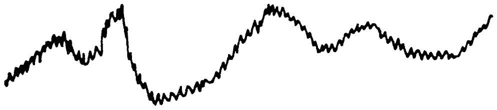
7-2-1. Reel Zero Gram Torque Adjustment

- After this adjustment, perform the Section 7-2-2 Reel 250 Gram Torque Adjustment.

Tool: Oscilloscope
Mode: Threading end mode
Preparation:
(1) Set DIP switch S101-Bit 1 on the SV-82 Board to ON.
(2) Without inserting a cassette tape, press the STOP button. Then the unit is put into the threading mode.
(3) Short between TP4 on the SV-82 Board and GND with a shorting clip.
(4) Connect the oscilloscope to TP13 on the SV-83A Board.

Check procedure:
(1) Check that the voltage at TP13 meets the required specification.
(2) Connect the oscilloscope to TP14 on the SV-83A Board.
(3) Check that the voltage at TP14 meets the required specification.
(4) Perform Steps (3) and (4) of the adjustment procedure so that the voltages at TP13 and TP14 meet the both specifications.

Adjustment procedure:
(1) Adjust RV15 on the SV-83A Board to meet the required specification at TP13.
(2) Adjust RV16 on the SV-83A Board to meet the required specification at TP14.
(3) Remove the shorting clip between TP4 and GND. Press the EJECT button, then the unit is put into the unthreading mode.
(4) Set DIP switch S101-Bit 1 to OFF.



The mean value is 0 ± 0.5V.

7-2-2. Reel 250 Gram Torque Adjustment

- It is required that Section 7-2-1 Reel Zero Gram Torque Adjustment is correct before initiating this adjustment.

Tool: Reel table tension gauge
Tension scale (100 g full scale)

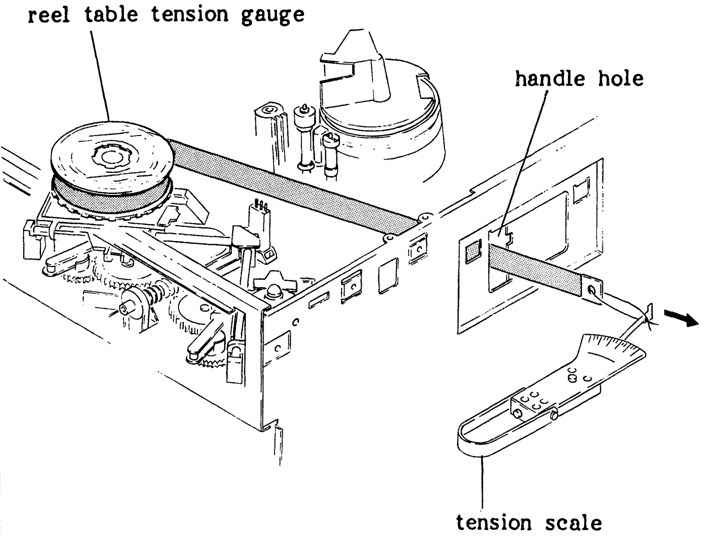
Mode: Threading end mode

Preparation:

(1) Remove the handle on the right side.
(2) Open the RP-29P Board Block.
(3) Remove the tape beginning sensor.
(4) Set DIP switch S101-Bit 1 on the SV-82 Board to ON.
(5) Without inserting a cassette tape, press the STOP button. The unit is then put into the threading mode.
(6) Short between TP4 on the SV-82 Board and GND with a shorting clip.
(7) Set DIP switch S101-Bit 1 on the SV-82 Board to OFF.

Check procedure:

(1) Wind the tape to the reel table tension gauge in the clockwise direction.
(2) Stop the rotation of the Supply Reel Table by hand and install the reel table tension gauge on the Supply Reel Table. Pass the end of the tape out for the unit from the hole of the handle.
(3) Hook a tension scale to an end of the string. Move the tension scale in the direction of the arrow and check that the scale reading is 65 to 70g.
(4) Remove the reel table tension gauge from the Supply Reel Table and wind the tape to the reel table tension gauge in the counterclockwise direction.
(5) Stop the rotation of the Take-up Reel Table by hand and install the reel table tension gauge on the Take-up Reel Table. Pass the end of the tape out for the unit from the hole of the handle.
(6) Hook a tension scale to an end of the string. Move the tension scale in the direction of the arrow and check that the scale reading is 65 to 70g.



Spec.:
65g ～ 70g (scale value)

(7) Perform Steps (3) and (4) of the adjustment procedure so that scale readings meet the both specifications.

Adjustment procedure:

(1) Adjust RV4 on the SV-83A Board to meet the required specification at supply side.

(2) Adjust RV13 on the SV-83A Board to meet the required specification at take-up side.

(3) Set DIP switch S101-Bit 1 on the SV-82 Board to ON and remove the shorting clip between TP4 and GND.

(4) Press the EJECT button. The unit is then put into the unthreading mode. After the unthreading is completed, set DIP switch S101-Bit 1 on the SV-82 Board to OFF.

SECTION 8
TAPE RUN ALIGNMENT

ALIGNMENT INFORMATION

MODES

Unthreading end mode

This indicates the EJECT completion mode. At the time of ejection, the tension regulator arm and threading ring are completely returned to the cassette tape side.

Threading mode

When the STOP button is pressed, the threading ring rotates counterclockwise.

Threading end mode (STOP mode)

When the STOP button is pressed, the threading ring rotates counterclockwise, and the threading ring rotation is then stopped.

PLAY mode without a cassette tape

(1) Remove the Cassette-up Compartment (refer to Section 4-2).
(2) Set DIP switch S106 on the SY-61 Board to ON.
(3) Set System Setup *Item 902 to 1.
(At that time, message "Error" appears on the time counter display of the front panel. The unit is activated normally irrespective of its message.)
(4) When the STOP button is pressed, the threading ring rotates counterclockwise, and the threading ring rotation is stopped. The STANDBY lamp then lights, and the unit enters the STOP mode.
(5) When the PLAY button is pressed, the pinch roller is pressed against the capstan shaft, and the unit enters the PLAY mode.
(6) After adjustment is completed, set System Setup *Item 902 to 0.
(7) Set DIP switch S106 on the SY-61 Board to OFF.
(8) Install the Cassette-up Compartment.

STANDBY OFF mode without a cassette tape

(1) Put the unit into the STOP mode without a cassette tape (refer to Steps 1 through 4 described above).
(2) Press the STANDBY button after the STANDBY lamp lights.
The STANDBY lamp then goes off, and the unit enters the STANDBY OFF mode in which the drum rotation is stopped.
(3) After adjustment is completed, set System Setup *Item 902 to 0.
(4) Set DIP switch S106 on the SY-61 Board to OFF.
(5) Install the Cassette-up Compartment.

REV mode without a cassette tape

(1) Remove the Cassette-up Compartment (refer to 4-2).

(2) Set DIP switch S106 on the SY-61 Board to ON.

(3) Set System Setup *Item 902 to 1.
(At that time, message "Error" appears on the time counter display of the front panel. This unit is activated normally irrespective of its message.)

(4) When the STOP button is pressed, the threading ring rotates counterclockwise, and the threading ring rotation is stopped. The STANDBY lamp then lights, and the unit enters the STOP mode.

(5) Turn the search dial counterclockwise. The unit then enters the REV mode.

(6) After adjustment is completed, set System Setup *Item 902 to 0.

(7) Set DIP switch S106 on the SY-61 Board to OFF.

(8) Insall the Cassette-up Compartment.

Creating the Cassette Tape without Lid

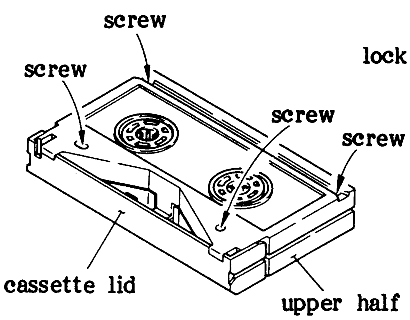
Since the VTR is compact, some checks and adjustments cannot be performed if a cassette tape lid is installed. Remove the cassette tape lid as follows:

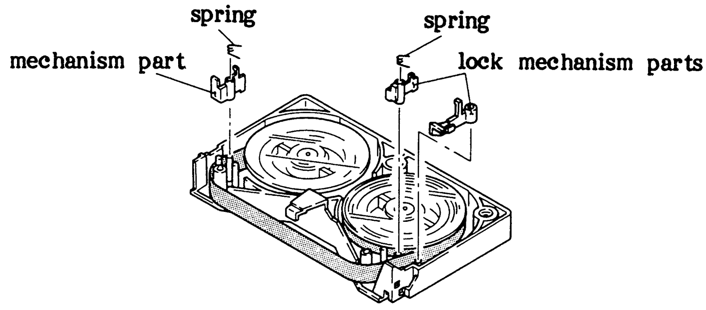
(1) As shown in the figure, remove the four screws on the back of cassette tape BCT-20M and remove the upper half of the cassette tape.

(2) Remove the lock mechanism parts and the springs on the left and right.

(3) Remove the cassette lid from the upper half.

(4) Install the upper half on the lower half with four screws from the back side.





Creating the Alignment tape without Lid

Since the VTR is compact, tracking is difficult to adjust if an alignment tape is installed. Remove the lid of alignment tape CR2-1B PS for tracking adjustment. For removing, refer to the "Creating the Cassette Tape without Lid".

* Item 902

For setting, refer to the Setup in 1-7-1. To display this item, turn the SEARCH dial while pressing the PLAY button.

Note: Item 900 series are used only at the factory. Setting should not be thus changed. When setting is changed, be sure to return it to the initial value.

ALIGNMENT INFORMATION

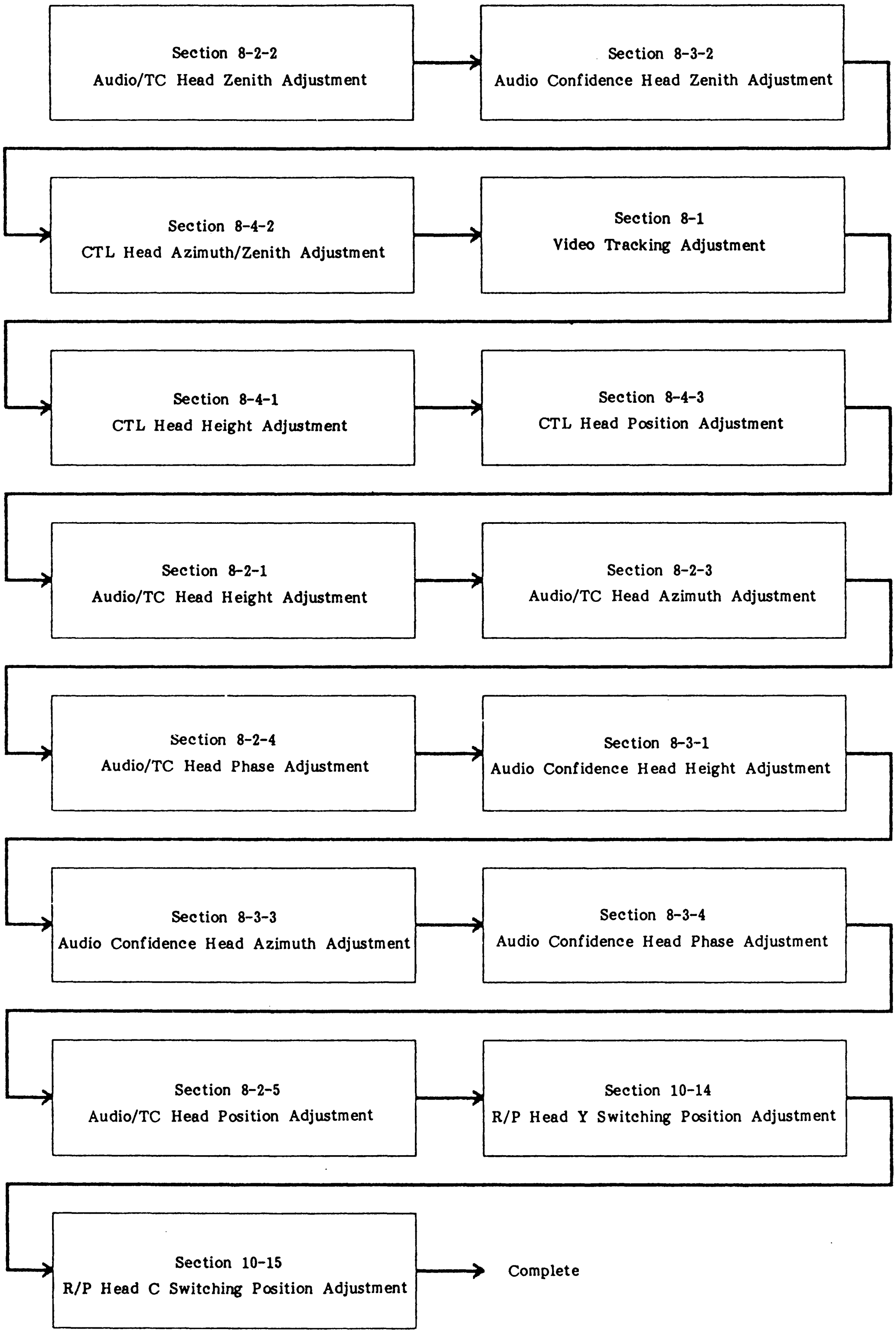
ALIGNMENT TAPE

- Alignment tape for tracking adjustment
  CR2-1B PS (8-960-096-51)

- Alignment tape for general adjustment
  CR8-1A PS (8-960-098-45)
  CR8-1B PS (8-960-096-86)

TRACKING ADJUSTMENT

- The tracking adjustment is required to be performed in the following order:


Section 8-2-2
Audio/TC Head Zenith Adjustment
Section 8-3-2
Audio Confidence Head Zenith Adjustment
Section 8-4-2
CTL Head Azimuth/Zenith Adjustment
Section 8-1
Video Tracking Adjustment
Section 8-4-1
CTL Head Height Adjustment
Section 8-4-3
CTL Head Position Adjustment
Section 8-2-1
Audio/TC Head Height Adjustment
Section 8-2-3
Audio/TC Head Azimuth Adjustment
Section 8-2-4
Audio/TC Head Phase Adjustment
Section 8-3-1
Audio Confidence Head Height Adjustment
Section 8-3-3
Audio Confidence Head Azimuth Adjustment
Section 8-3-4
Audio Confidence Head Phase Adjustment
Section 8-2-5
Audio/TC Head Position Adjustment
Section 10-14
R/P Head Y Switching Position Adjustment
Section 10-15
R/P Head C Switching Position Adjustment
Complete

8-1. VIDEO TRACKING ADJUSTMENT

Tool: Alignment tape, CR2-1B PS
Oscilloscope
Hex. key (across flat has 1.27 mm)
Inspection mirror

Mode: Play back the alignment tape

Preparation:

(1) Turn DIP switch S101-Bit4 on the SV-82 Board to "ON". (The phi-square servo circuit is off.)

(2) Turn DIP switch S1 on the SV-83A Board to "ON". (The H-LOCK servo circuit is off.)

(3) Remove the DM-56P Board. Extend it with an Extension Board.

(4) Connect the oscilloscope as follows:
CH-1: TP6/DM-56P Board
EXT. TRIG: TP26/DM-56P Board

(5) Play back the alignment tape.

Check procedure:

(1) When turn the TRACKING control knob, check that the RF waveform maintains a flat envelope while the amplitude increases and decreases.

(2) Check that the RF envelope fluctuation and head-to-tape contact are within the specification at the FIXED position of the TRACKING control knob.

(3) Check that the tape curls at the Tension Regulator, TG-1, TG-2, TG-3, and the Tape Threading Guide meets the required specification. (Refer to the adjustment procedure for specification.)

(4) Check that the RF envelope head-to-tape contact is within the specification in the about REV x 1 mode.

Adjustment procedure:

- When adjust the tape guide height.
  Loosen the setscrews of each tape guide in upper portion and adjust with the adjusting nut.

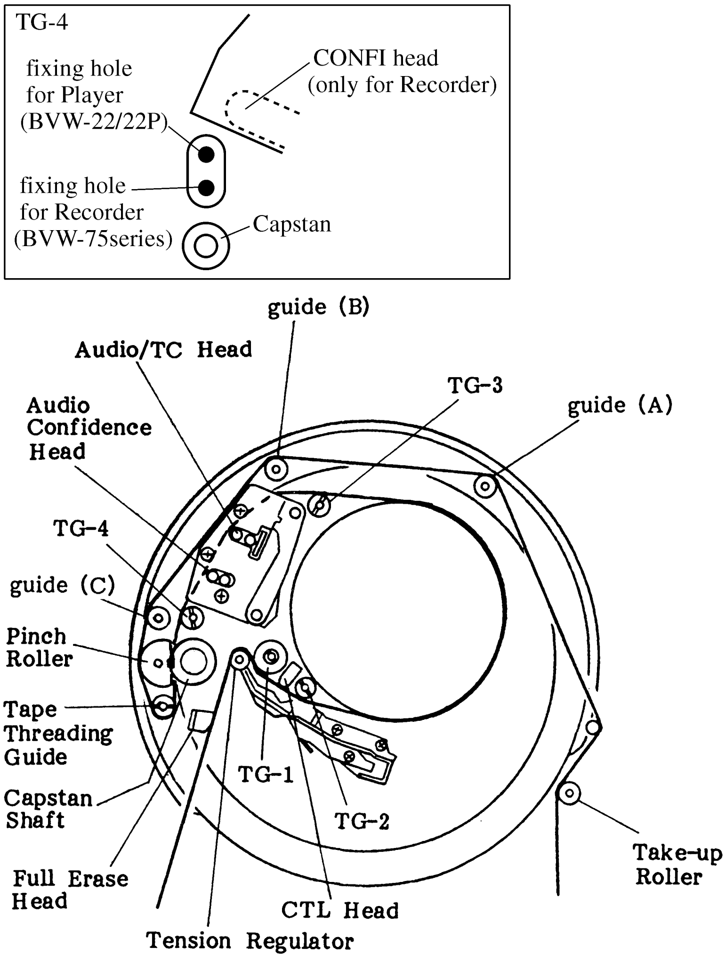
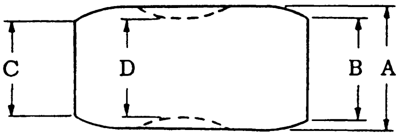

TG-4
fixing hole for Player (BVW-22/22P)
CONFI head (only for Recorder)
fixing hole for Recorder (BVW-75series)
Capstan
guide (B)
Audio/TC Head
TG-3
guide (A)
Audio Confidence Head
TG-4
guide (C)
Pinch Roller
Tape Threading Guide
Capstan Shaft
Full Erase Head
TG-1
TG-2
CTL Head
Tension Regulator
Take-up Roller

Fig. 1



spec:

- During FWD
  Head contact $\frac{C}{A} \geq 0.8$
  $\frac{B}{A} \geq 0.8$
  Head contact fluctuation
  $\frac{D}{A} \geq 0.9$
- During REV
  Head contact $\frac{C}{A} \geq 0.6$
  $\frac{B}{A} \geq 0.6$

. When the tracking at the drum entrance side is not good.

(1) Turn the adjusting nuts of TG-1 and TG-2. Make clearances at (a) and (b) of TG-1 and (a) and (b) of TG-2 as shown in figure 2.

(2) Turn the adjusting nut of the Tension Regulator so that the RF waveform envelope changes from state (i) to state (ii) as shown in Fig. 3. Check that the tape runs in contact with the guide flange at the (a) portion of the Tension Regulator. If not, turn adjustment screw (b) of the Tension Regulator in counter-clockwise direction as shown in Fig. 4.

(3) Turn the adjusting nut of TG-2 so that the tape runs in contact with the guide flange at the (b) portion of TG-2 and the RF waveform envelope flattens.
Check that the tape does not in contact with the guide flange at the (b) portion of TG-1. The tape curl at the (a) portion of Tension Regulator and/or (b) portion of TG-2 is acceptable within the range shown in Fig. 5. Tape curl at the drum, however, is not acceptable.

(4) Turn the TRACKING control knob to the FIXED position. Put the unit into the REV x 1 mode.

(5) Check that the RF waveform envelope is small at the drum entrance side as shown in Fig. 6.

(6) Put the unit into the PLAY mode. Turn the adjusting nut of TG-1 so that the tape runs in contact with the guide flange at the (a) portion. The tape curl at (a) portion is acceptable within the range shown in Fig. 5.

(7) Put the unit into the REV x 1 mode. Check that the RF envelope waveform is flat and the tape-to-head contact meets the required specification.

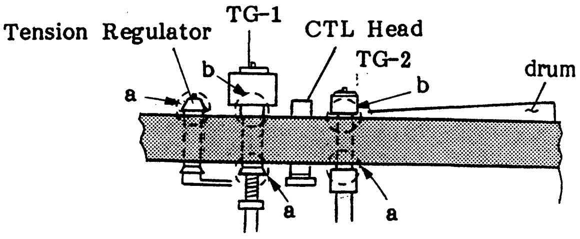
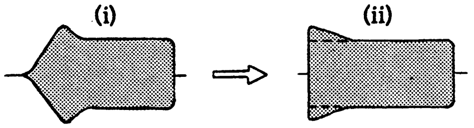


Fig. 2



When tape portion "a" of the Tension Regulator shown in Fig. 2 is pressed down, the waveform should be flat.

Fig. 3

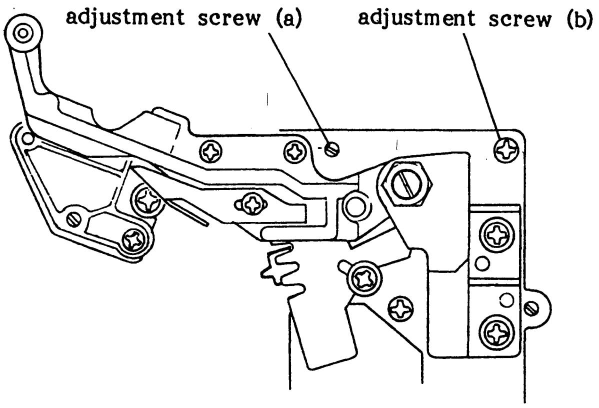
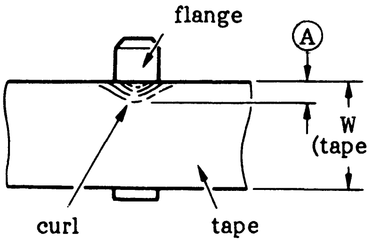


Fig. 4



spec:
Ⓐ$\leqq \frac{1}{6}$W

Fig. 5

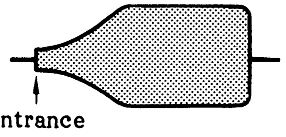


Fig. 6

http://getMANUAL.com

(8) Put the unit into the PLAY mode. Check that the tape-to-head contact meets the required specification.

(9) Tighten the setscrews of each tape guide, and check again.

(10) Restore the DIP switch setting as described in preparation steps (1) and (2).

- When the tracking at the drum exit side is not good.

(1) Turn the adjusting nuts of TG-3 and TG-4, and make clearances at (a) of TG-3, (b) of TG-4, and (a) and (b) of the Tape Threading Guide as shown in Fig. 7.

(2) Turn the adjusting nut of TG-4 so that the RF waveform envelope changes from state (i) to state (ii) shown in Fig. 8. Check that the tape does not in contact with the guide flange at the (a) portion of TG-3 or (a) portion of the Tape Threading Guide.

(3) Turn the adjusting nut of TG-3 so that the tape runs in contact with the guide flange at the (a) portion of TG-3 and the RF waveform envelope flattens. The tape curl is acceptable within the range shown in Fig. 5.

(4) Turn the adjusting nut of the Tape Threading Guide so that the tape runs lightly in contact with the guide flange at the (a) portion.

(5) Turn the TRACKING control knob to the FIXED position. Check that the tape-to-head contact meets the required specification.

(6) Put the unit into the REV x 1 mode.

(7) Check that the RF waveform envelope is flat and the tape-to-head contact meets the required specification.

(8) Tighten the setscrews of each tape guide, and check again.

(9) Restore the DIP switch setting as described in preparation steps (1) and (2).

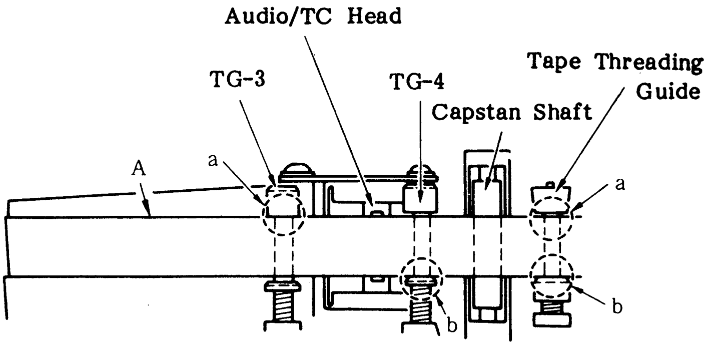
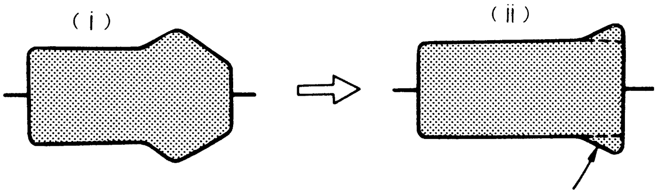


Fig. 7

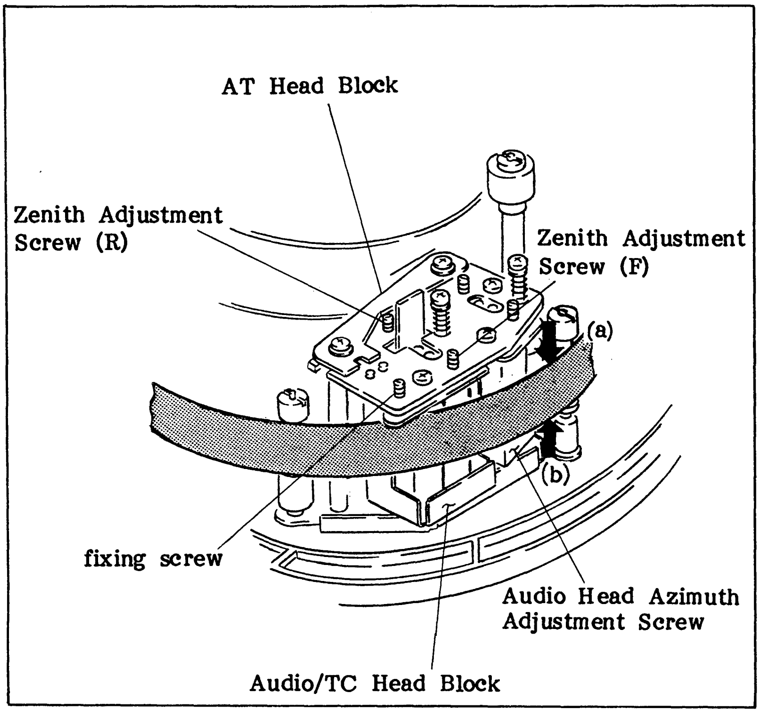


When tape portion "A" shown in Fig. 7 is pressed down, the waveform should be flat.

Fig. 8

8-2. AUDIO/TC HEAD ADJUSTMENT

8-2-1. Audio/TC Head Height Adjustment


AT Head Block
Zenith Adjustment Screw (R)
Zenith Adjustment Screw (F)
(a)
(b)
fixing screw
Audio Head Azimuth Adjustment Screw
Audio/TC Head Block

Tool: Alignment tape, CR8-1A PS
Dual-trace oscilloscope or VTVM

Mode: Play back the alignment tape.

Preparation:

(1) Check that DIP switch S301 on the AU-76P Board is OFF. (Audio signal is played back in the AT Head.)

(2) Check that the "DOLBY NR" switch on the Sub Panel is OFF. (The Dolby NR (Noise Reduction) circuit is off.)

(3) Connect the oscilloscope or VTVM to the AUDIO OUT CH-1 or CH-2.

(4) Play back the last 1kHz signal segment on the alignment tape. (Never play back the 1kHz signal segment at the tape top.)

Check procedure:

(1) When pressing down the tape at (a) portion, check that the level decreases.

(2) When pushing up the tape at (b) portion, check that the level decreases.

Adjustment procedure:

. When the level increases while pressing down the tape at (a) portion.

(1) Remove the Cleaning Roller Block.

(2) Loosen the fixing screw 2 to 3 turns.

(3) Turn the Zenith Adjustment Screws (R) and (F) in the counterclockwise direction and turn the Azimuth Height Adjustment Screw an exactly equal amount in the clockwise direction. Adjust for maximum output waveform.

(4) Tighten the fixing screw and check again.

- When the level increases while pushing up the tape at (b) portion.

(5) Turn the Zenith Adjustment Screws (R) and (F) in the clockwise direction and turn the Azimuth Height Adjustment Screw an exactly equal amount in the counter-clockwise direction. Adjust for maximum output waveform.

(6) Tighten the fixing screw and check again.

(7) Perform Section 8-2-2, Audio/TC Head Zenith Adjustment; Section 8-2-3, Audio/TC Head Azimuth Adjustment; Section 8-2-4, Audio/TC Head Phase Adjustment; and Section 8-2-5, Audio/TC Head Position Adjustment.

(8) Install the Cleaning Roller Block, perform Section 6-9, Cleaning Roller Position Adjustment.

8-2-2. Audio/TC Head Zenith Adjustment

Tool: Flatness plate

Mode: Unthreading end mode

Check procedure:

(1) Check that the clearance between the head and the flatness plate meets the required specification when the flatness plate is placed on the Audio/TC Head and TG-3.

Adjustment procedure:

- If there is the clearance at the bottom portion.

(1) Remove the Cleaning Roller Block.

(2) Loosen the fixing screw of the AT Head Block 1/4 to 1 turn.

(3) Turn the Zenith Adjustment Screw (R) in the clockwise direction to meet the required specification.

(4) Tighten the fixing screw and check again.

- If there is the clearance at the top portion.

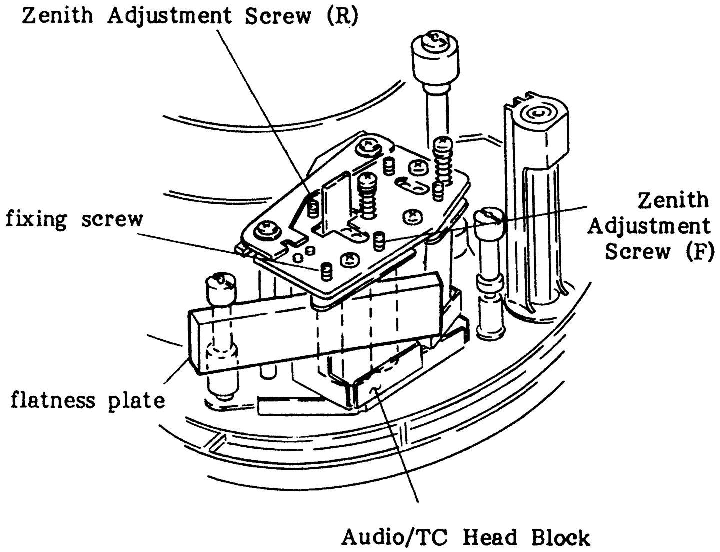
(5) Loosen the fixing screw of the AT Head Block 1/4 to 1 turn.

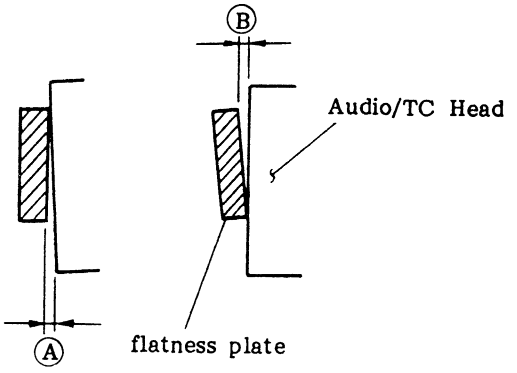
(6) Turn the Zenith Adjustment Screw (R) in the counterclockwise direction to meet the required specification.

(7) Tighten the fixing screw and check again.

(8) After adjustment, perform Section 8-2-1, Audio/TC Head Height Adjustment; Section 8-2-3, Audio/TC Head Azimuth Adjustment; Section 8-2-4, Audio/TC Head Phase Adjustment; and Section 8-2-5, Audio/TC Head Position Adjustment.

(9) Install the Cleaning Roller Block, perform Section 6-9, Cleaning Roller Position Adjustment.


Zenith Adjustment Screw (R)
fixing screw
Zenith Adjustment Screw (F)
flatness plate
Audio/TC Head Block


Ⓑ
Audio/TC Head
Ⓐ
flatness plate

Spec.:
0≤ Ⓐ ≤0.1mm
Ⓑ = 0mm

8-2-3. Audio/TC Head Azimuth Adjustment

Tool: Alignment tape, CR8-1B PS
Dual-trace oscilloscope or VTVM

Mode: Play back the alignment tape.

Preparation:

(1) Check that DIP switch S301 on the AU-76P Board is OFF. (Audio signal is played back in the AT Head.)

(2) Check that the "DOLBY NR" switch on the Sub Panel is OFF. (The Dolby NR (Noise Reduction) circuit is off.)

(3) Connect the oscilloscope to the AUDIO OUT CH-1 or CH-2 terminal.

(4) Play back the audio 15kHz signal portion on the alignment tape.

Adjustment procedure:

(1) Remove the Cleaning Roller Block.

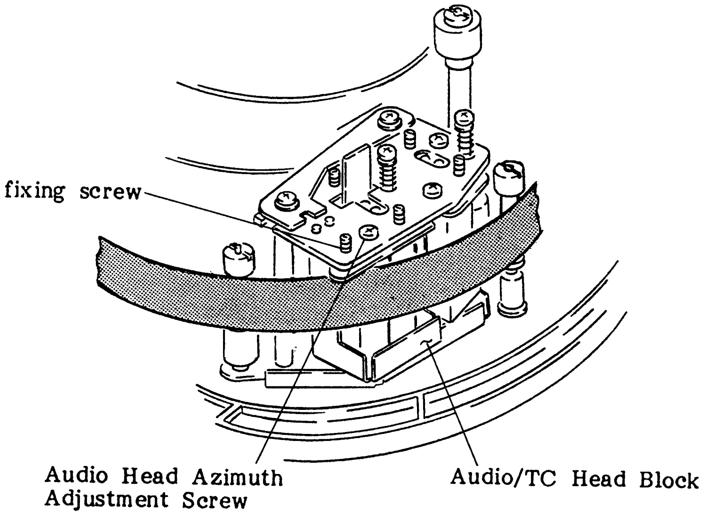
(2) Loosen the fixing screw 1 turn.

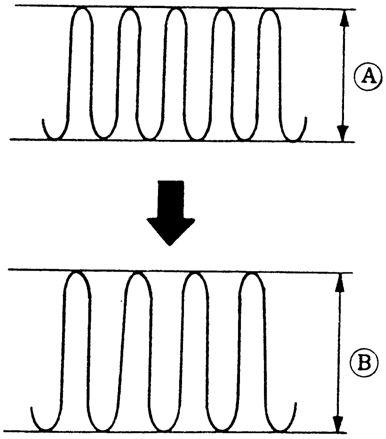
(3) Adjust for the maximum output level by turning the Audio Head Azimuth Height Adjustment screw.

(4) Tighten the fixing screw, check it again.

(5) After adjustment, perform Section 8-2-1, Audio/TC Head Height Adjustment; Section 8-2-4, Audio/TC Head Phase Adjustment; and Section 8-2-5, Audio/TC Head Position Adjustment.

(6) Install the Cleaning Roller Block, perform Section 6-9, Cleaning Roller Position Adjustment.





Spec.:
$\frac{B}{A} \leq 1.05$

8-2-4. Audio/TC Head Phase Adjustment

Tool: Alignment tape, CR8-1B PS
Dual-trace oscilloscope

Mode: Play back the alignment tape.

Preparation:

(1) Check that DIP switch S301 on the AU-76P Board is OFF. (Audio Signal is played back in the AT Head.)

(2) Check that the "DOLBY NR" switch on the Sub Panel is OFF. (The Dolby NR (Noise Reduction) circuit is off.)

(3) Connect the horizontal and vertical terminals of the oscilloscope to the AUDIO OUT CH-1 and CH-2 terminals.

(4) Play back the audio 15kHz portion on the alignment tape.

(5) Adjust the scope for horizontal and vertical amplitudes for a 6 cm lissajous waveshape.

Check procedure:

(1) Check that the lissajous waveshape meets the required specification at 15kHz.

Adjustment procedure:

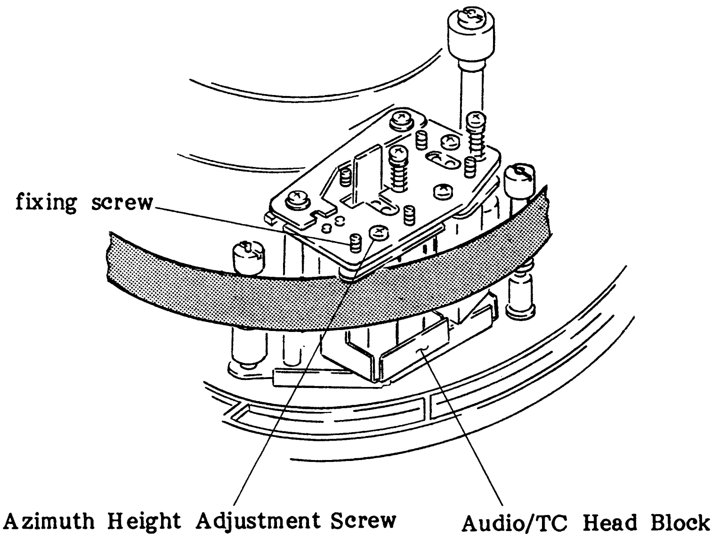
(1) Remove the Cleaning Roller Block.

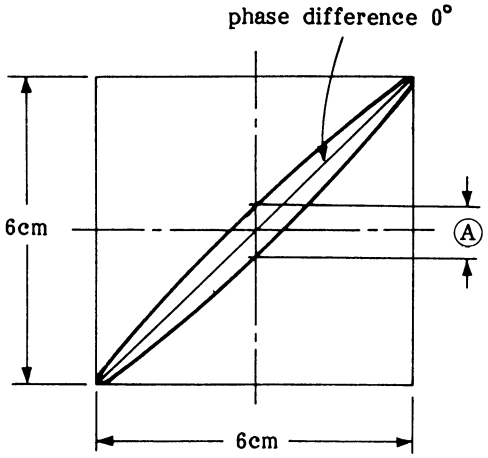
(2) Loosen the fixing screw 1/4 to 1/2 turn.

(3) Turn the Azimuth Height Adjustment Screw to meet the required specification.

(4) Tighten the fixing screw and check again.

(5) Install the Cleaning Roller Block, perform Section 6-9, Cleaning Roller Position Adjustment.





Spec.:
15kHz: Ⓐ ≤0.52cm

8-2-5. Audio/TC Head Position Adjustment

- It is required that the Section 8-4-3, CTL Head Position Adjustment is checked to be correct before initiating this adjustment.

Tool: Alignment tape, CR2-1B PS
Dual-trace oscilloscope

Mode: Play back the alignment tape.

Preparation:

(1) Connect the oscilloscope as follows:
CH-1: TP101/SV-84P Board
CH-2: TP207/TC-40P Board
TRIG: INTERNAL, CH-1

(2) Play back the alignment tape.

Check Procedure:

(1) Check that the waveform meets the required specification.

Adjustment procedure:

(1) Remove the Cleaning Roller Block.

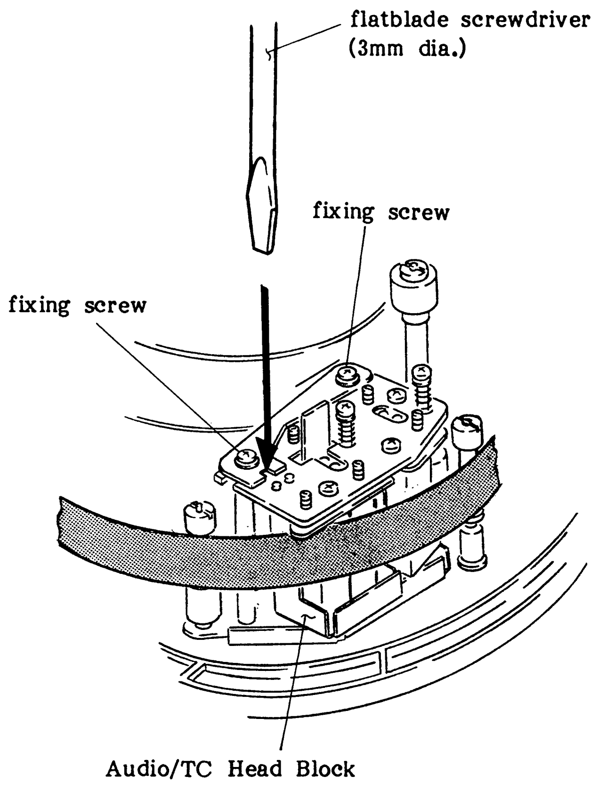
(2) Loosen the fixing screws.

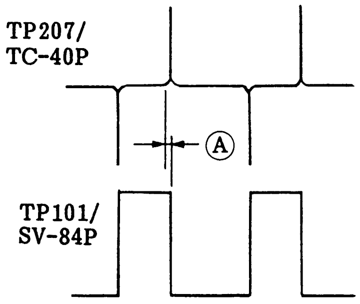
(3) Adjust the position of the head block with a flatblade screwdriver (3 mm dia.) to meet the required specification.

(4) Tighten the fixing screws, check again.

(5) Perform Section 8-2-1, Audio/TC Head Height Adjustment; Section 8-2-2, Audio/TC Head Zenith Adjustment; Section 8-2-3, Audio/TC Head Azimuth Adjustment; and Section 8-2-4, Audio/TC Head Phase Adjustment.

(6) Install the Cleaning Roller Block, perform Section 6-9, Cleaning Roller Position Adjustment.

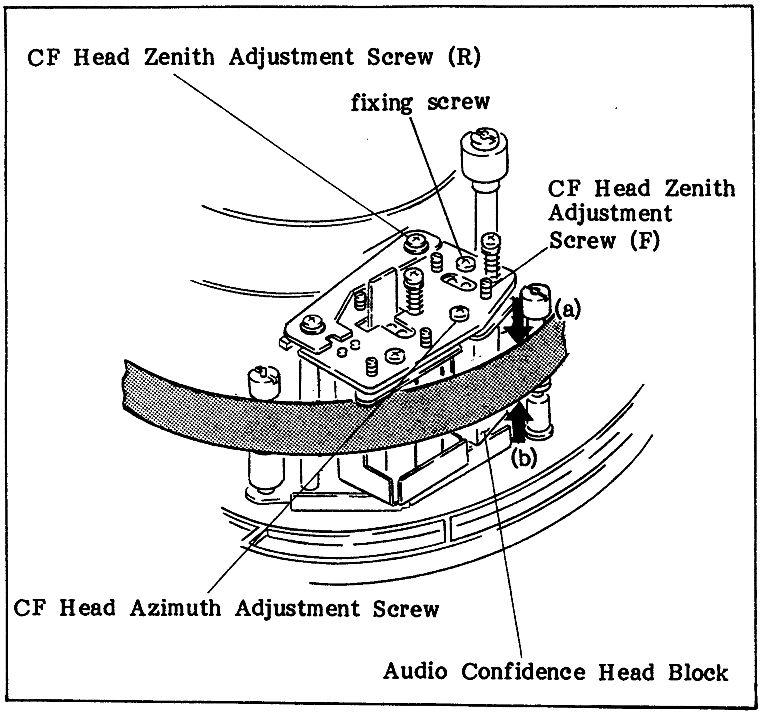




Spec.:
Ⓐ = 0 ± 400μsec

8-3. AUDIO CONFIDENCE HEAD ADJUSTMENT

8-3-1. Audio Confidence Head Height Adjustment


CF Head Zenith Adjustment Screw (R)
fixing screw
CF Head Zenith Adjustment Screw (F)
(a)
(b)
CF Head Azimuth Adjustment Screw
Audio Confidence Head Block

Tool: Alignment tape, CR8-1B PS
Dual-trace oscilloscope or VTVM

Mode: Play back the alignment tape.

Preparation:

(1) Turn DIP switch S301 on the AU-76P Board to on. (Audio signal is played back in the CF Head.)

(2) Check that the "DOLBY NR" switch on the Sub Panel is off. (The Dolby NR (Noise Reduction) circuit is off.)

(3) Connect the oscilloscope or VTVM to the AUDIO OUT CH-1 or CH-2.

(4) Play back the last 1kHz signal segment on the alignment tape. (Never play back the 1kHz signal segment at the tape top.)

Check procedure:

(1) When pressing down the tape at (a) portion, check that the level decreases.

(2) When pushing up the tape at (b) portion, check that the level decreases.

Adjustment procedure:

. When the level increase while pressing down the tape at (a) portion.

(1) Remove the Cleaning Roller Block.

(2) Loosen the fixing screw of the CF Head 2 to 3 turns.

(3) Turn the Zenith Adjustment Screws (R) and (F) in the counterclockwise direction and turn the CF Head Azimuth Height Adjustment Screw in the clockwise direction an exactly equal amount. Adjust for maximum output waveform.

(4) Tighten the fixing screw and check again.

- When the level increases while pushing up the tape at (b) portion.

(5) Turn the CF Head Zenith Adjustment Screws (R) and (F) in the clockwise direction and turn the CF Head Azimuth Height Adjustment Screw in the counter-clockwise direction an exactly equal amount. Adjust for maximum output waveform.

(6) Tighten the fixing screw and check again.

(7) Restore the DIP switch setting as described in preparation step (1).

(8) Perform Section 8-3-2, Audio Confidence Head Zenith Adjustment; Section 8-3-3, Audio Confidence Head Azimuth Adjustment; and Section 8-3-4, Audio Confidence Head Phase Adjustment.

(9) Install the Cleaning Roller Block, perform Section 6-9, Cleaning Roller Position Adjustment.

8-3-2. Audio Confidence Head Zenith Adjustment

Tool: Flatness plate
Mode: Unthreading end mode
Check procedure:

(1) Check that the clearance between the head and the flatness plate meets the required specification when the flatness plate is placed on the Audio Confidence Head and the TG-4.

Adjustment procedure:

. If there is the clearance at the bottom.

(1) Remove the Cleaning Roller Block.

(2) Loosen the fixing screw of the Audio Confidence Head Block 1/4 to 1 turn.

(3) Turn the CF Head Zenith Adjustment Screw (R) in the clockwise direction to meet the required specification.

(4) Tighten the fixing screw and check again.

. If there is the clearance at the top.

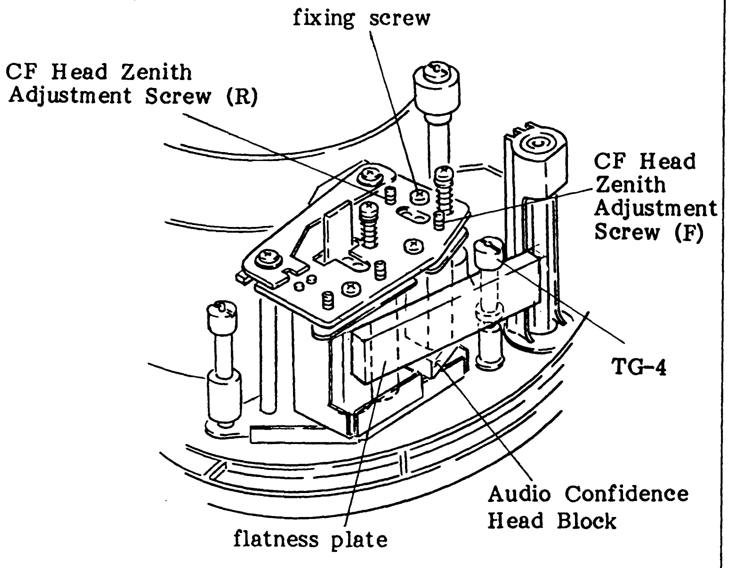
(5) Loosen the fixing screw of the Audio Confidence Head Block 1/4 to 1 turn.

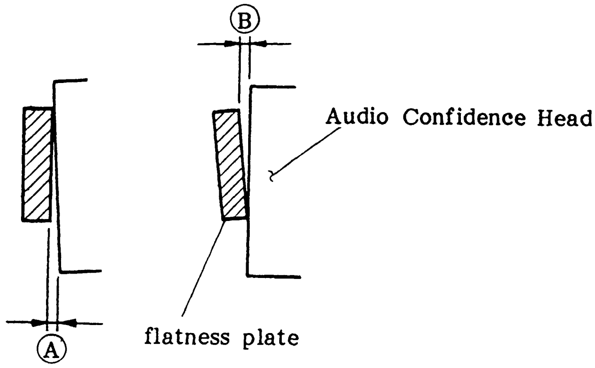
(6) Turn the CF Head Zenith Adjustment Screw (R) in the counterclockwise direction to meet the required specification.

(7) Tighten the fixing screw and check again.

(8) After adjustment, perform Section 8-3-1, Audio Confidence Head Height Adjustment; Section 8-3-3, Audio Confidence Head Azimuth Adjustment; and Section 8-3-4, Audio Confidence Head Phase Adjustment.

(9) Install the Cleaning Roller Block, perform Section 6-9, Cleaning Roller Position Adjustment.


fixing screw
CF Head Zenith Adjustment Screw (R)
CF Head Zenith Adjustment Screw (F)
TG-4
Audio Confidence Head Block
flatness plate


Ⓑ
Audio Confidence Head
flatness plate
Ⓐ

Spec.:
0≤ Ⓐ ≤0.05mm
Ⓑ = 0mm

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8-3-3. Audio Confidence Head Azimuth Adjustment

Tool: Alignment tape, CR8-1B PS
Dual-trace oscilloscope or VTVM

Mode: Play back the alignment tape.

Preparation:

(1) Turn DIP switch S301 on the AU-76P Board to on. (Audio signal is played back in the CF Head.)

(2) Check that the "DOLBY NR" switch on the Sub Panel is off. (Dolby NR (Noise Reduction) circuit is off.)

(3) Connect the oscilloscope to the AUDIO OUT CH-1 or CH-2 terminal.

(4) Play back the audio 15kHz signal portion on the alignment tape.

Adjustment procedure:

(1) Remove the Cleaning Roller Block.

(2) Loosen the fixing screw of the CF Head 1 turn.

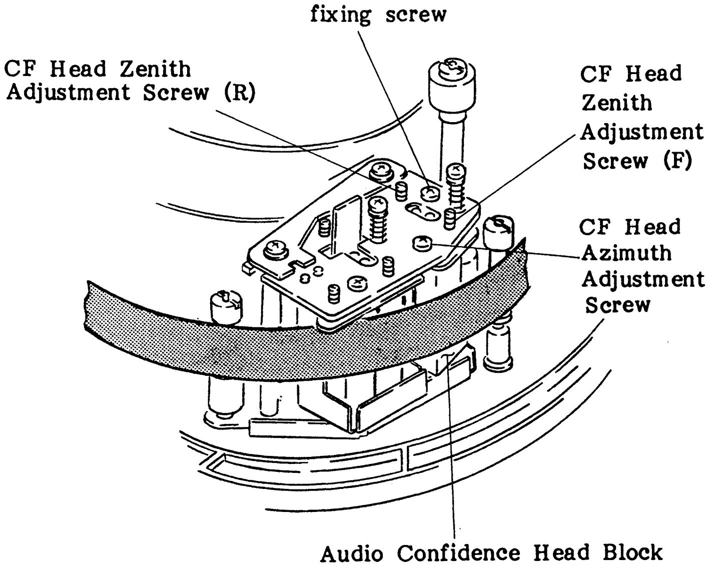
(3) Adjust for the maximum output level by turning the CF Head Azimuth Height Adjustment screws.

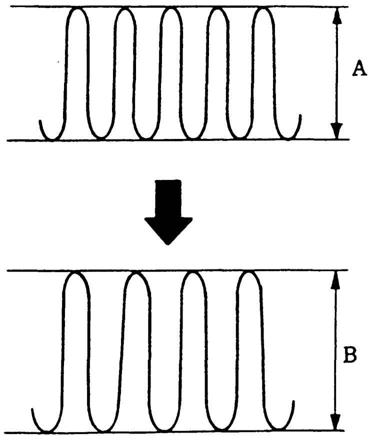
(4) Tighten the fixing screw, check again.

(5) After adjustment, restore the DIP switch as described in preparation step (1).

(6) Perform Section 8-3-4, Audio Confidence Head Phase Adjustment; and Section 8-3-1, Audio Confidence Head Height Adjustment.

(7) Install the Cleaning Roller Block, Perform Section 6-9, Cleaning Roller Position Adjustment.


fixing screw
CF Head Zenith Adjustment Screw (R)
CF Head Zenith Adjustment Screw (F)
CF Head Azimuth Adjustment Screw
Audio Confidence Head Block



Spec.:
$\frac{B}{A} \leqq 1.05$

8-3-4. Audio Confidence Head Phase Adjustment

Tool: Alignment tape, CR8-1B PS
Dual-trace oscilloscope

Mode: Play back the alignment tape.

Preparation:

(1) Turn DIP switch S301 on the AU-76P Board to on. (Audio signal is played back in the CF Head.)

(2) Check that the "DOLBY NR" switch on the Sub Panel is off. (The Dolby NR (Noise Reduction) circuit is off.)

(3) Connect the horizontal and vertical terminals of the oscilloscope to the AUDIO OUT CH-1 and CH-2 terminals.

(4) Play back the audio 15kHz portion on the alignment tape.

(5) Adjust the scope for horizontal and vertical amplitudes for a 6 cm lissajous waveshape.

Check procedure:

(1) Check that the lissajous waveshape meets the required specification at 15kHz.

Adjustment procedure:

(1) Remove the Cleaning Roller Block.

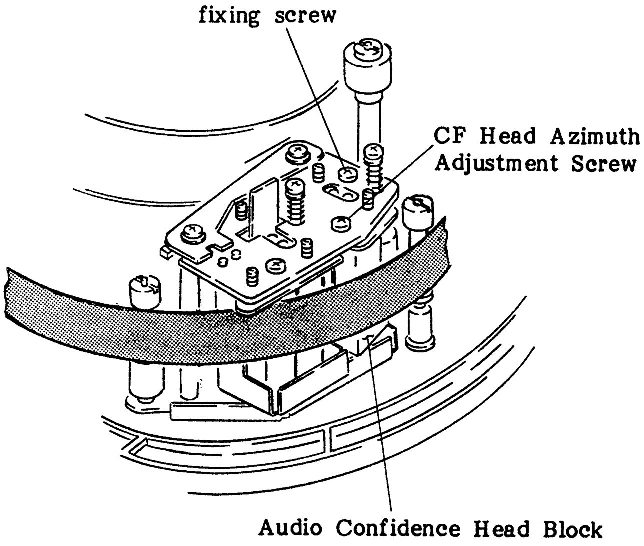
(2) Loosen the fixing screw 1/4 to 1/2 turn.

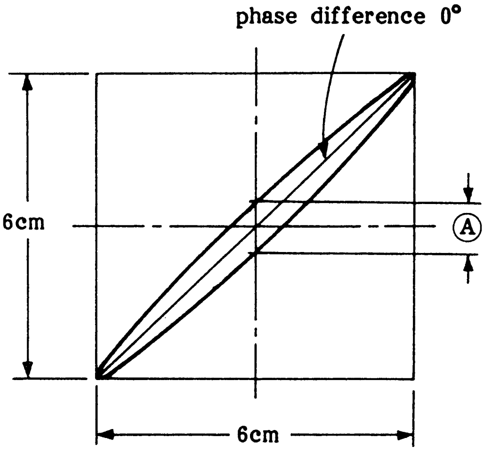
(3) Turn the CF Head Azimuth Height Adjustment Screw to meet the required specification.

(4) Tighten the fixing screw and check again.

(5) Restore the DIP switch setting as described in preparation step (1).

(6) Install the Cleaning Roller Block, perform Section 6-9, Cleaning Roller Position Adjustment.





Spec.:
15kHz: Ⓐ ≦0.52cm

8-4. CTL HEAD ADJUSTMENT

8-4-1. CTL Head Height Adjustment

Tool: Alignment tape, CR8-1A PS
Oscilloscope

Mode: Play back the alignment tape.

Preparation:

(1) Remove the SV-84P Board, extend it with an Extension Board.

(2) Connect the oscilloscope as follows:
CH-1: TP100/SV-84P Board
TRIG: INTERNAL, CH-1

(3) Turn DIP switch S101-bit 3 on the SV-82 Board to on.

(4) Insert the alignment tape, and play back the audio 1kHz signal portion recorded on the CTL track of the alignment tape.

Check procedure:

(1) Open the RP-29P Boards Block.

(2) When pressing the tape down and pushing it up at (A) portion, check that both levels decrease. If the levels increase, the following adjustments are required.

Adjustment procedure:

. When the levels increase while pressing down the tape at (A) portion.

(1) Loosen the locking screw 1 turn.

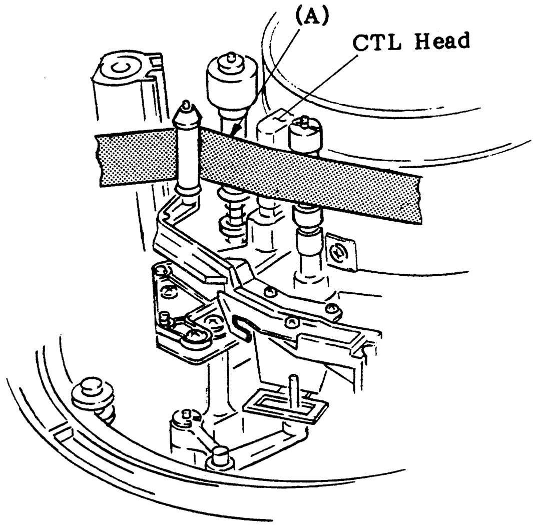
(2) Turn the adjustment screw (D) in the counterclockwise direction and turn the adjustment screws (C) and (B) in the clockwise direction an exactly equal amount. Adjust for maximum output waveform.

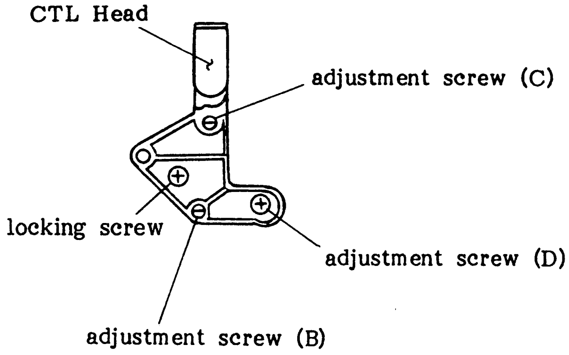
(3) Tighten the locking screw and check again.

. When the levels increase while pushing up the tape at (A) portion.

(4) Loosen the locking screw 1 turn.

(5) Turn adjustment screw (D) in the clockwise direction and turn the adjustment screws (C) and (B) in the counterclockwise direction an exactly equal amount. Adjust the maximum output waveform.





(6) Tighten the locking screw and check again.

(7) After adjustment, perform Section 8-4-2, CTL Head Azimuth/Zenith Adjustment; and Section 8-4-3, CTL Head Position Adjustment.

(8) Turn DIP switch S101-bit 3 on the SV-82 Board to off.

8-4-2. CTL Head Azimuth/Zenith Adjustment

Tool: Cassette reference plate (L)
Tension regulator slantness check tool

Mode: Threading end mode

Check procedure:

(1) Open the RP-29P Boards Block.

(2) Install the cassette reference plate (L) into the cassette position.

(3) Place the tension regulator slantness check tool at the CTL Head as shown in the figure. Check that the slantness of the CTL Head meets the required specification.

Adjustment procedure:

. When the zenith is out of spec.

(1) Loosen the locking screw 1 turn.

(2) Adjust the zenith with adjustment screw (C) to meet the required specification.

(3) Tighten the locking screw and check the azimuth and zenith.

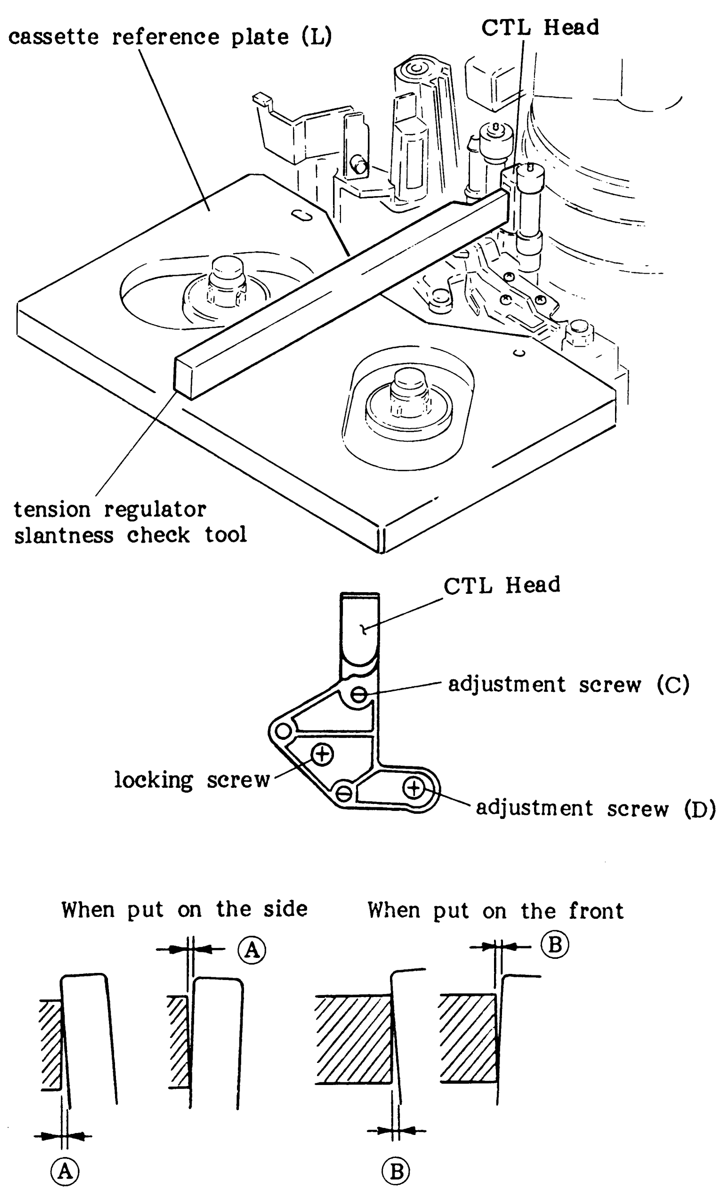
. When the azimuth is out of spec.

(4) Loosen the locking screw 1 turn.

(5) Adjust the azimuth with adjustment screw (D) to meet the required specification.

(6) Tighten the locking screw and check the azimuth and zenith.

(7) After adjustment, perform Section 8-4-1, CTL Head Height Adjustment; and Section 8-4-3, CTL Head Position Adjustment.


cassette reference plate (L)
CTL Head
tension regulator
slantness check tool
CTL Head
adjustment screw (C)
locking screw
adjustment screw (D)
When put on the side
When put on the front
Ⓐ
Ⓑ
Ⓐ
Ⓑ

Spec.:
Ⓐ $\leqq 0.1$mm
Ⓑ $\leqq 0.1$mm

8-4-3. CTL Head Position Adjustment

Tool: Alignment tape, CR2-1B PS
Oscilloscope

Mode: Play back the alignment tape.

Preparation:

(1) Turn DIP switch S101-bit4 on the SV-82 Board to "ON". (The phi-square servo circuit is off.)

(2) Turn DIP switch S1 on the SV-83A Board is on. (The H-LOCK servo circuit is off.)

(3) Open the RP-29P Boards Block.

(4) Remove the DM-56P Board, extend it with an Extension Board.

(5) Connect the oscilloscope as follows:
CH-1: TP6/DM-56P Board
EXT. TRIG: TP21/DM-56P Board

(6) Play back the alignment tape.

Check procedure:

(1) While turning the TRACKING control knob, check that the RF envelope has the maximum amplitude at the FIXED position.

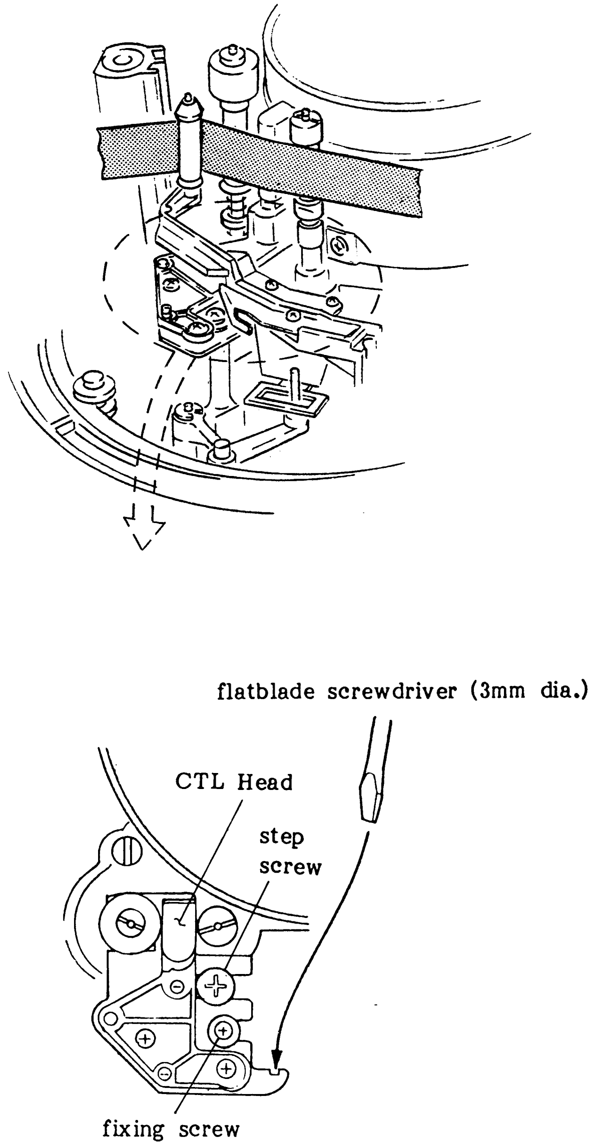
Adjustment procedure:

(1) Loosen the fixing screw 1/4 to 1/2 turn.

(2) Insert a flatblade screwdriver (3 mm dia.) into the hole of the CTL Head Base. Adjust the position of the CTL Head Block to meet the required specification.

(3) After adjustment, perform Section 8-2-5, TC Head Position Adjustment.

(4) Restore the DIP switch setting as described in preparation steps (1) and (2).



8-5. T DRAWER GUIDE BLOCK TAPE RUN ADJUSTMENT

Check procedure:

(1) Insert the BCT-20M cassette tape and press the PLAY button.

(2) Check that the tape runs in the tape width direction before and behind a Slantness Guide without uneven tape tension.

(3) Check that no tape curl occurs on the upper and lower flanges of the T Roller.

(4) Pres the F.FWD button.

(5) Check that the tape runs and no tape curl occurs as described in procedures (2) and (3).

(6) Press the REW button.

(7) Check that the tape runs and no tape curl occurs as described in procedures (2) and (3).

Adjustment procedure:

- When the upper edge of the tape slackens or the tape curl occurs on the upper flange.

(1) Loosen the fixing screw as shown in the figure.

(2) Insert the flatblade screwdriver into the notch and turn it moving counterclockwise.

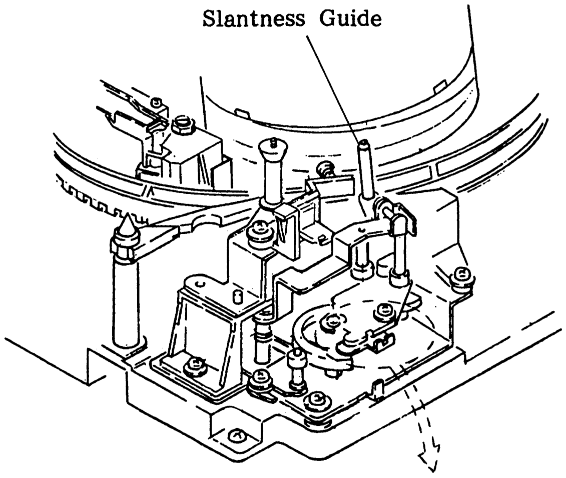
- When the lower edge of the tape slackens or the tape curl occurs on the lower flange.

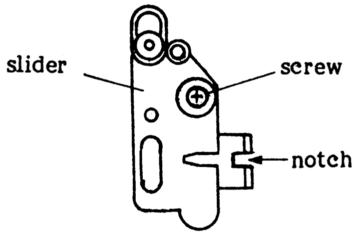
(3) Loosen the fixing screw as shown in the figure.

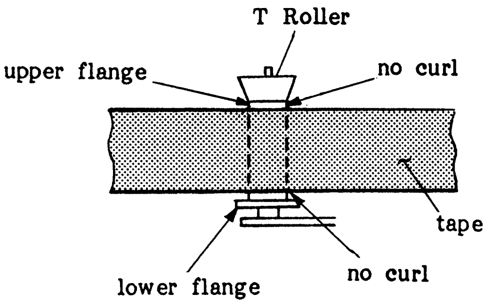
(4) Insert the flatblade screwdriver into the notch and turn it moving clockwise.

(5) After adjustment, tighten the fixing screw and check again.

Note: To prevent a slider from damage, put your fingers under the slider when loosening or tightening the screw. Then, hold the screwdriver's force with your fingers.







8-6. SLIP RING BRUSH POSITION ADJUSTMENT

Check procedure:

(1) Check that the position of the brush and ring meets the required specification.

(2) Check that the brush is in the groove of the ring as shown in the figure.

Adjustment procedure:

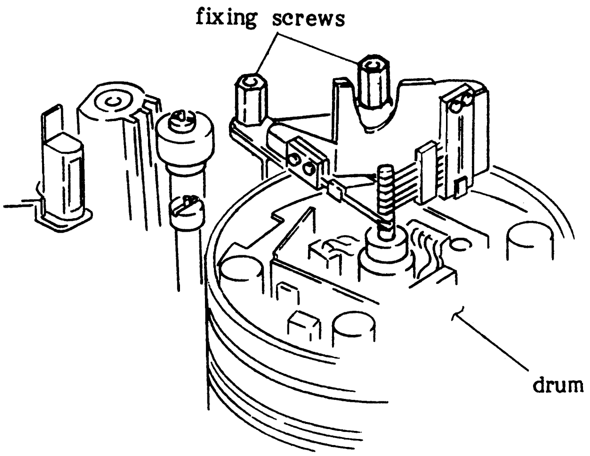
(1) Remove the Brush Cover.

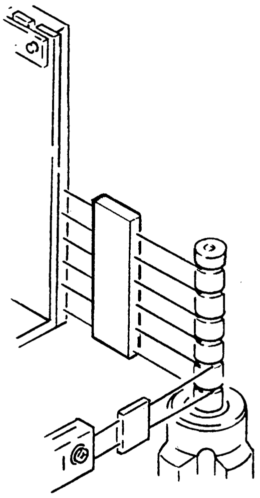
(2) Loosen the fixing screws 1/2 to 1 turn.

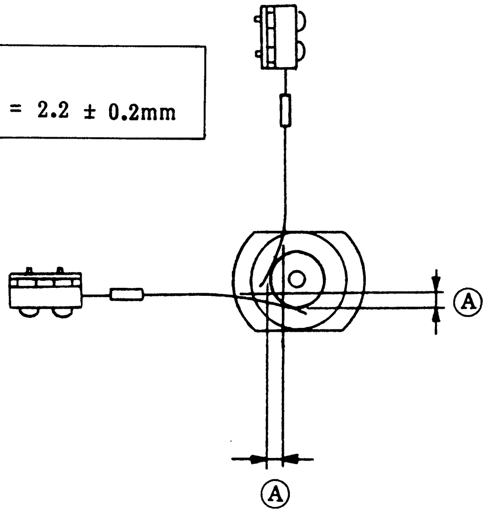
(3) Adjust the position of the brush so that it is in the groove of the ring and bending meets the required specification.

(4) Tighten the fixing screws and check again.

(5) Install the Brush Cover.







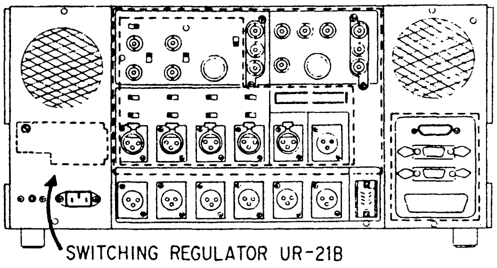
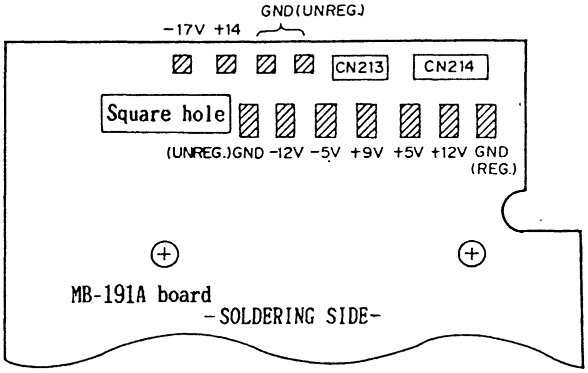
Spec.:

Ⓐ = 2.2 ± 0.2mm

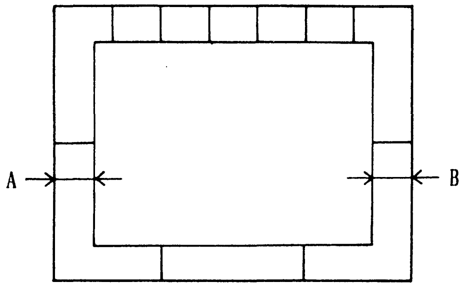
SECTION 9
POWER AND CONTROL SYSTEM ALIGNMENT

9-1. DC VOLTAGE REGULATOR (UR-21B) ADJUSTMENT

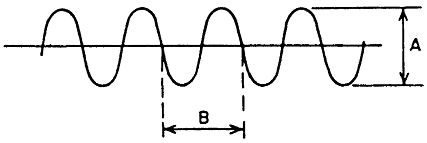
• Serial No. 10001 through 16862

machine conditions for adjustment	specifications	adjustments
• Remove the power block from the unit. (Refer to Sec. 4-3.) • Connect the connectors again. • Solder the lead wires at the land on the MB-191A board (at the back of the main unit), and connect a digital voltmeter to the lead wire. • Turn on the power. • Insert a blank tape and put the unit into the REC mode. • Using an alignment tool, adjust the voltage from the outside of the switching regulator's outer cabinet.	Connector Panel  SWITCHING REGULATOR UR-21B  GND(UNREG.) -17V +14 CN213 CN214 Square hole (UNREG.)GND -12V -5V +9V +5V +12V GND (REG.) MB-191A board -SOLDERING SIDE-	
	• +12V adjustment Between +12V regulator and GND land/MB-191A +12.1 ± 0.3Vdc	Switching regulator ⊘RV51/UR-21B-C2 (+12V ADJ)
	• −12V adjustment Between -12V regulator and GND land/MB-191A −12.1 ± 0.3Vdc	Switching regulator ⊘RV251/UR-21B-M2 (−12V ADJ)
	• +5V adjustment Between +5V regulator and GND land/MB-191A +5.1 ± 0.25Vdc	Switching regulator ⊘RV51/UR-21B-C1 (+5V ADJ)
• After adjustment is completed, install the switching regulator and other parts.	• −5V adjustment Between -5V regulator and GND land/MB-191A −5.1 ± 0.25Vdc	Switching regulator ⊘RV201/UR-21B-M1 (−5V ADJ)

9-2. VIDEO OUT-3 CHARACTER POSITION ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Supply a color-bars signal to the VIDEO IN connector. • Connect a monitor to the VIDEO OUT 3 connector. • INPUT SELECT sw: COMPOSITE • Set S101 (CHARACTER switch) on the SY-61 board to ON and press S103 (SETUP MENU switch) on the SY-61 board.	 A = B (A - B should be within a 1/4 scale of the section)	Position ⊘CV102/SY-61(C-7)
• Press S103 on the SY-61 board again.		H side ⊘CV101/SY-61(C-7)

9-3. TAPE BEGINNING SENSOR OSCILLATION LEVEL CHECK

machine conditions for adjustment	specifications	adjustments
Step 1 • S101-Bit1/SV-82: ON • MODE: STOP • Minimize the center fluctuation in the oscilloscope's TRIG level. • Check that the waveform satisfies specification 1. Step 2 • Place the tape beginning sensor near a screwdriver. Check that specification 2 is satisfied. • After adjustment is completed, set S101-Bit 1 to OFF.	TP402/SY-64P(I-7)  Spec 1 : A = 200 mVp-p or more B = 5 ± 1 μsec Spec 2 : Check that the mode is selected into FF.	TRIG: INT

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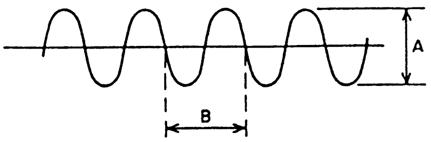
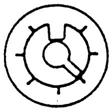
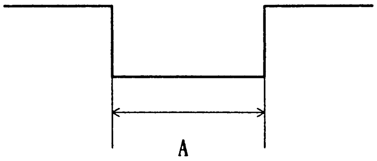
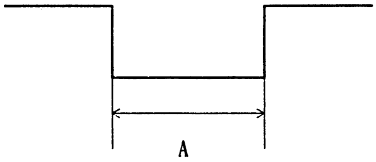
9-4. TAPE END SENSOR OSCILLATION LEVEL CHECK

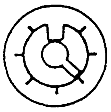
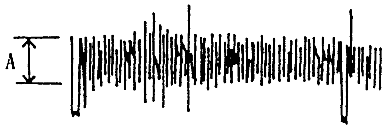
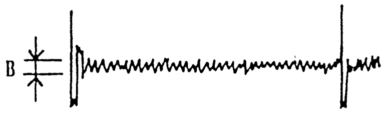
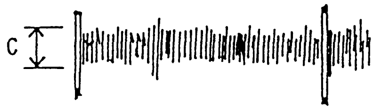
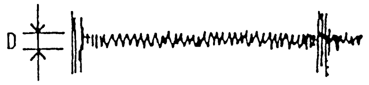
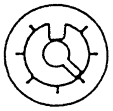
machine conditions for adjustment	specifications	adjustments
Step 1 • S101-Bit1/SV-82: ON • MODE: STOP • Minimize the center fluctuation in the oscilloscope's TRIG level. • Check that the waveform satisfies specification 1. Step 2 • Place the tape end sensor near a screwdriver. Check that specification 2 is satisfied. • After adjustment is completed, set S101-Bit 1 to OFF.	TP404/SY-64P(I-6)  Spec 1 : A = 200 mVp-p or more B = 3.3 ± 1.0 μsec Spec 2 : Check that the mode is selected into REW.	TRIG: INT

9-5. COUNT H POSITION ADJUSTMENT (Up to S/N 11735)

• Before performing this adjustment, perform Sec. 13 TBC Alignment.

machine conditions for adjustment	specifications	adjustments
• Set RV303 on the SY-64P board (G-5) to the mechanical center position, and RV304 on the SY-64P board (G-6) to the following figure position.  • Play back a 100% color-bar signal on alignment tape CR5-1B PS.	TP309/SY-64P(F-4)  A = 10 ± 1 μsec	⊘RV305/SY-64P(G-5) TRIG: INT
	IC6 pin 6 or IC25 pin 12/SY-64P  A = 12 ± 1 μsec	⊘RV399/SY-64P(G-5) TRIG: INT

9-6. IMPACT ERROR OUTPUT LEVEL ADJUSTMENT (Up to S/N 11735)

machine conditions for adjustment	specifications	adjustments
• Check that RV303 on the SY-64P board (G-5) is set to the mechanical center position and that RV304 on the SV-64P board (G-6) is set to the figure position below.  • Play back a 100% color-bar signal on alignment tape CR5-1B PS. • Turn S301 (H-8) or S302 (G-8) on the SY-64P board ON and OFF.	TP306/SY-64P(G-6) (GND: E4/SY-64P(I-6)) S301: OFF  S301: ON  B/A < 1/4	⊘RV303/SY-64P(G-5) (Generally, RV303 is set to the mechanical center position.)
	TP307/SY-64P(G-7) (GND: E4/SY-64P(I-6)) S302: OFF  S302: ON  D/C < 1/3	⊘RV304/SY-64P(G-6) (Generally, RV304 is set to the figure position below.) 

SECTION 10
SERVO SYSTEM ALIGNMENT

【Equipment Required】
- DC voltmeter
- Dual-trace oscilloscope
- Frequency counter
- Shorting clip
- Alignment tape CR2-1B PS
- Alignment tape CR5-2A PS
- Alignment tape CR5-1B PS

【Video Signals Required】
- PAL video signal: This is a video signal provided with a specified sync signal that can be used for both color, and black and white systems.

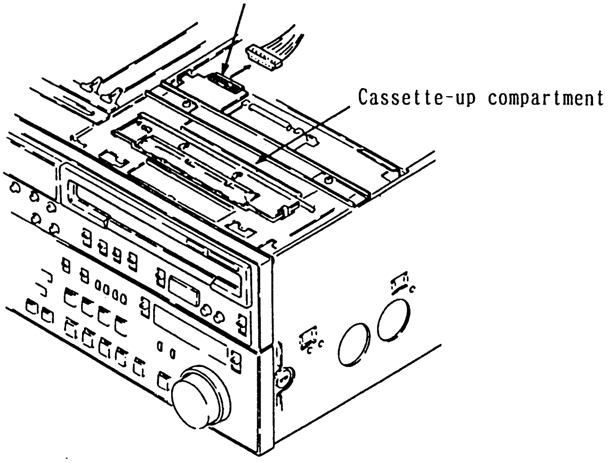
10-1. PREPARATION

Since the machine may start runaway tape operation when the SV-83A board, reel table, and reel table rotation detecting element (DME) are replaced, the following adjustments should be performed before inserting a cassette tape.

- Section 10-3 Supply Reel FG Duty Cycle Adjustment
- Section 10-4 Take-up FG Duty Cycle Adjustment

When the SV-84P board and head drum are replaced, perform Section 10-9 Drum Free Speed Adjustment.

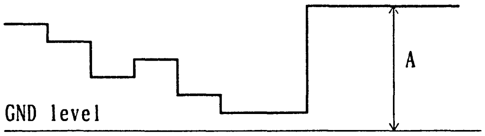
How to operate the machine without a cassette tape
- Remove CN331 on the CL-14 board and take out the cassette-up compartment.
- Set S101-Bit 1 on the SV-82 board to ON.
- When the STOP button is pressed, the threading ring rotates counterclockwise.



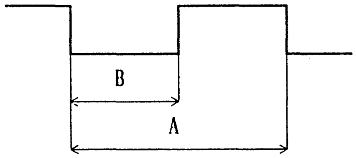
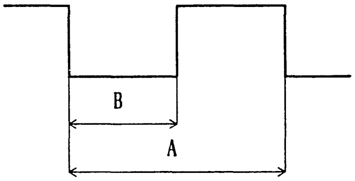
PLAY: Set S106 on the SY-61 board to ON, System Setup *Item 902 to 1, and then press the PLAY button.
After adjustment is completed, set S106 to OFF and *Item 902 to "0".

* Item 900 Series
For setting, refer to the Setup in 1-7-1. To display this item, turn the SEARCH dial while pressing the PLAY button.
Note: Item 900 series are used only at the factory. Setting should not be thus changed.
When setting is changed, be sure to return it to the initial value.

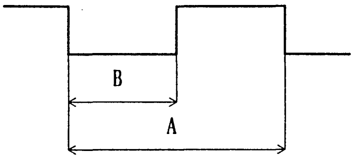
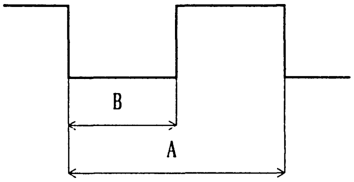
10-2. D/A OUTPUT VOLTAGE ADJUSTMENT

machine conditions for adjustment	specification	adjustments
• MODE: EE	CH-1: TP103/SV-82(E-5) CH-2: TP101/SV-82(E-4)  A: Make the voltage at TP103 on the SV-82 same as that at TP101 on the SV-82 board.	⊘RV101/SV-82(E-4) TRIG(+): TP104/SV-82 (E-5)

10-3. SUPPLY REEL FG DUTY CYCLE ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Play back alignment tape CR2-1B PS at about 10 minute-portion from tape top.	TP7/SV-83A(D-8)  Duty cycle (B/A)= 50 ± 5%	⊘RV9/SV-83A(B-4) TRIG: TP7/SV-83A(D-8)
	TP8/SV-83A(D-7)  Duty cycle (B/A) = 50 ± 5%	⊘RV10/SV-83A(C-4) TRIG: TP8/SV-83A(D-7)

10-4. TAKE-UP REEL FG DUTY CYCLE ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Play back alignment tape CR2-1B PS at about 10 minute-portion from tape top.	TP9/SV-83A(D-8)  Duty cycle (B/A) = 50 ± 5%	⊘RV11/SV-83A(B-4) TRIG: TP9/SV-83A(D-8)
	TP10/SV-83A(D-8)  Duty cycle (B/A) = 50 ± 5%	⊘RV12/SV-83A(A-4) TRIG: TP10/SV-83A(D-8)

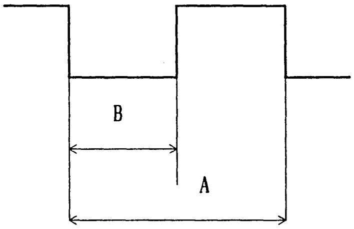
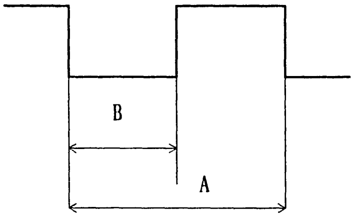
10-5. TENSION SENSOR IMPRESSED VOLTAGE ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• S101-Bit1/SV-82: ON • MODE: STOP • Make adjustments only after the power has been ON for 30 seconds or more. • After adjustment is completed, set the S101-Bit1 to OFF.	TP1/SV-83A(A-8) +9.0 ± 0.1 Vdc	⊘RV1/SV-83A(B-7)

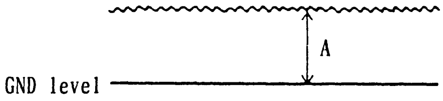
10-6. TENSION SENSOR AMP OFFSET ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• S101-Bit1/SV-82: ON • Using a shorting clip, short between TP4 on the SV-83A board and TP5 on the SV-83A board. • MODE: STOP • After adjustment is completed, remove the shorting clip and set S101-Bit 1 to OFF.	TP3/SV-83A(A-8) +2.5 ± 0.04 Vdc	⊘RV2/SV-83A(A-8)

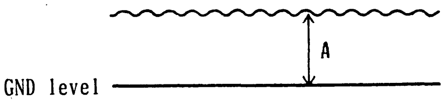
10-7. CAPSTAN FG DUTY CYCLE ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Supply a color-bars signal. • CAPSTAN LOCK sw: 2FD • INPUT SELECT sw: COMPOSITE • Insert the BCT-20M cassette and put the unit into the REC mode.	TP1/SV-84P(C-7)  B/A = 50 ± 5%	⊘RV2/SV-84P(C-6) TRIG(-): TP1/SV-84P(C-7)
	TP1/SV-84P(C-7)  B/A = 50 ± 5%	⊘RV3/SV-84P(C-5) TRIG(-): TP2/SV-84P(C-7)

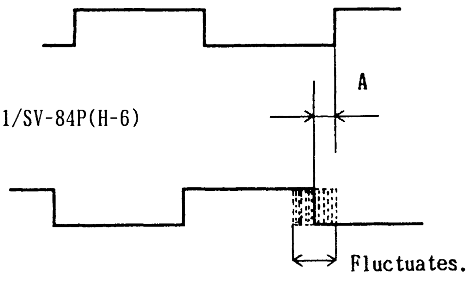
10-8. CAPSTAN FREE SPEED ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Supply a color-bars signal. • INPUT SELECT sw: COMPOSITE • Insert the BCT-20M cassette and put the unit into the REC mode.	TP4/SV-84P(F-9)  A = 2.5 ± 0.1 Vdc	⊘RV1/SV-84P(D-4)

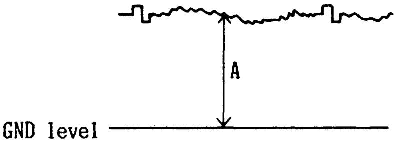
10-9. DRUM FREE SPEED ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• EXT/AUTO sw on connector Panel: EXT • Using a shorting clip, short between TP106 and TP107 on the SV-84P board. • S101-Bit4/SV-82; ON • Insert the BCT-20M cassette and and put the unit into the REC mode. • After adjustment is completed, remove the shorting clip. Return the EXT/AUTO switch to AUTO.	TP105/SV-84P(D-8)  A = 2.5 ± 0.1 Vdc	⊘RV102/SV-84P(C-2)

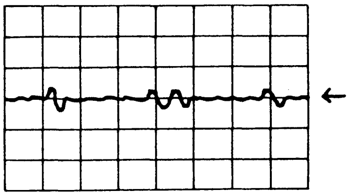
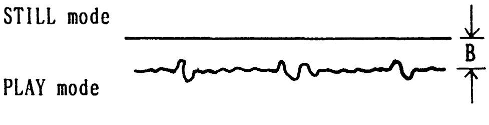
10-10. TRACKING CONTROL CENTERING ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Set the TRACKING control to the center click position. • Play back the alignment tape CR2-1B PS. • CONFI sw: OFF	TP102/SV-84P(H-1) TP101/SV-84P(H-6)  Note: When the waveform at TP101 fluctuates, measure it in its center. A = 0 ± 0.1 msec	⊘RV102/SV-82(D-1) TRIG(+): TP102/SV-84P(H-1)

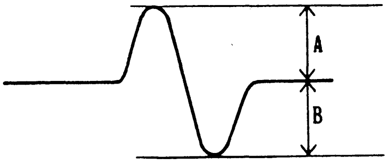
10-11. CAPSTAN STOP SERVO BIAS ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Insert alignment tape CR2-1B PS and put the unit into the SEARCH STILL mode. • Repeat FWD-STILL operation several times in the JOG mode. Check where the voltage at TP3 is minimized, then adjust.	TP3/SV-84P(G-4)  A = 0.3 ± 0.02 Vdc	⊘RV103/SV-82(D-1)

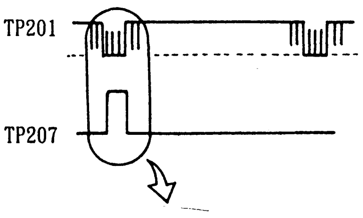
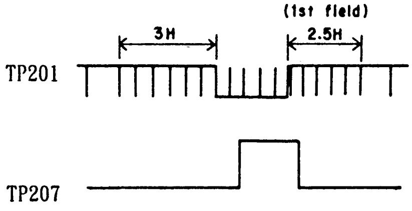
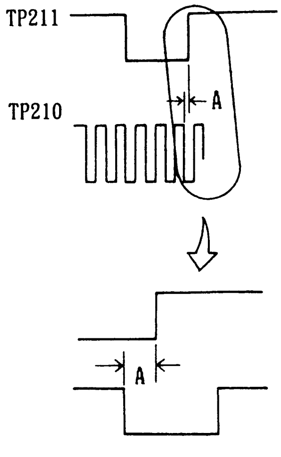
10-12. INSTANT START ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Set the TRACKING control to the center click position. • Insert alignment tape CR2-1B PS. Step 1 • MODE: PLAY	TP6/SV-84P(D-3)  After the servo is locked, adjust the waveform to the oscilloscope's center position. (Oscilloscope: DC mode)	
Step 2 • MODE: STILL	 B = 0 ± 0.2 Vdc	⊘RV4/SV-84P(E-5)

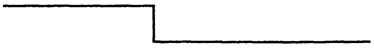
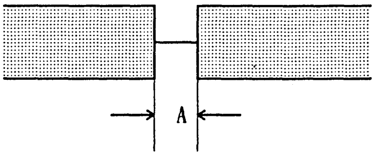
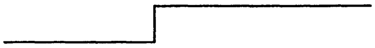
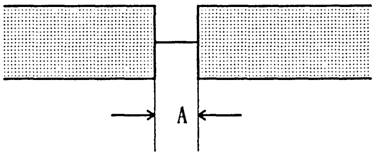
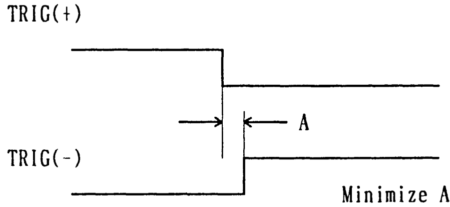
10-13. CAPSTAN ACCELERATION CORRECTION ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Insert the BCT-90ML cassette. • Turn the SEARCH dial and select five times and two times normal speeds.	TP3/SV-83A(A-8)  A = 0 ± 0.15 Vp-p B = 0 ± 0.15 Vp-p	⊘RV8/SV-83A(A-4)

10-14. SV FRAMING/FRAMING PULSE WIDTH ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
Step 1 • Supply a color-bars signal to the VIDEO IN and REF VIDEO IN connectors. • MODE: EE	CH-1: TP201/SV-83A(C-1) CH-2: TP207/SV-83A(E-3)  • Adjust RV210 on the SV-83A board so that one pulse is output every two fields.  • Check that the pulse portion is in the first field.	⊘RV210/SV-83A(E-5)
Step 2	CH-1: TP211/SV-83A(E-4) CH-2: TP210/SV-83A(E-4)  A = 8.0 ± 0.5 μses	⊘RV210/SV-83A(E-5) (Adjust RV210 to meet the both specifications of Steps 1 and 2.) TRIG: TP207/SV-83A(E-3)

10-15. R/P HEAD Y SWITCHING POSITION ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• S101-Bit 4/SV-82: ON • S1/SV-83A: ON • Insert alignment tape CR2-1B PS and put the unit into the PLAY mode. • Set the TRACKING control to the center click position.	TP901/DM-56P(C-1)  TP205/DM-56P(B-1)  Minimize A. (10 μsec or less)	⊘RV201/SV-83A(D-2) TRIG (+): TP901/DM-56P(C-1)
	TP901/DM-56P(C-1)  TP205/DM-56P(B-1)  Minimize A. (15 μsec or less)	⊘RV202/SV-83A(D-2) TRIG (-): TP901/DM-56P(C-1)
• After adjustment is completed, set S101-Bit4 on the SV-82 board and S1 on the SV-83A board to the former position.	TP901/DM-56P(C-1)  Minimize A. (5 μsec or less) Select the TRIG SLOPE (+/-) and check that the phase difference satisfies the specification.	• Fine adjustment ⊘RV201/SV-83A(D-2) ⊘RV202/SV-83A(D-2) TRIG: TP901/DM-56P(C-1)

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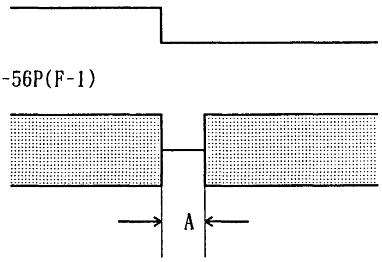
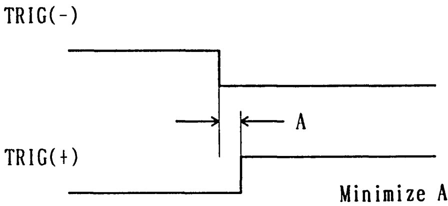
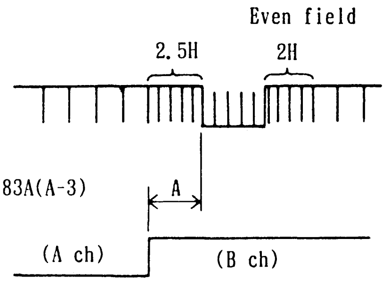
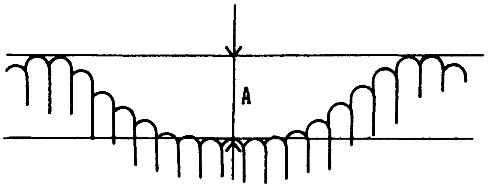
10-16. R/P HEAD C SWITCHING POSITION ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• S101- Bit4/SV-82: ON • S1/SV-83A: ON • Insert alignment tape CR2-1B PS and put the unit into the PLAY mode. • Set the TRACKING control to the center click position. • After adjustment is completed, set S101-Bit4 on the SV-82 board and S1 on the SV-83A board to the former position.	TP902/DM-56P(F-1) TP507/DM-56P(F-1)  Minimize A. Spec 1 (10 μsec or less)	⊘RV206/SV-83A(B-3) TRIG (+): TP902/DM-56P(F-1)
	TP902/DM-56P(F-1)  Minimize A. (5 μsec or less) Select the TRIG SLOPE (+/-) and check that the phase difference satisfies specification 2.	• Fine adjustment ⊘RV206/SV-83A(B-3) TRIG (+/-): TP902/DM-56P(F-1)

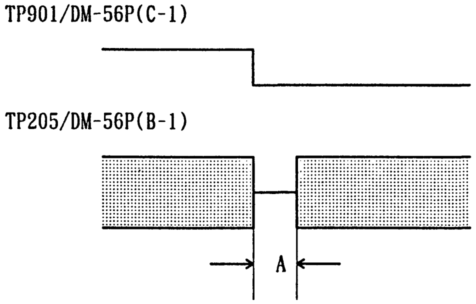
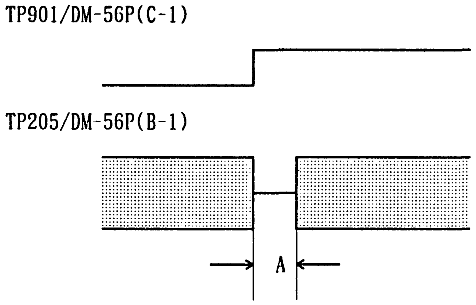
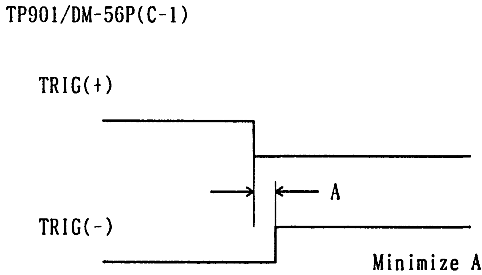
10-17. REC DRUM LOCK PHASE ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• AUTO/EXT sw on the connector panel: AUTO • Supply a color-bar signal. • S101- Bit4/SV-82: ON • S1/SV-83A: ON • INPUT SELECT sw:COMPOSITE • Insert the BCT-20G and put the unit into the REC mode. • CONFI sw: OFF • After adjustment is completed, set S101-Bit4 on the SV-82 board and S1 on the SV-83A board to the former position.	TP201/SV-83A(C-1) TP204/SV-83A(A-3)  A = 2.25 ± 0.1 H (A = 144 ± 6 μsec)	⊘RV202/SV-84P(C-1) TRIG: TP201/SV-83A(C-1)

10-18. PICTURE SPLITTING COMPENSATION ADJUSTMENT

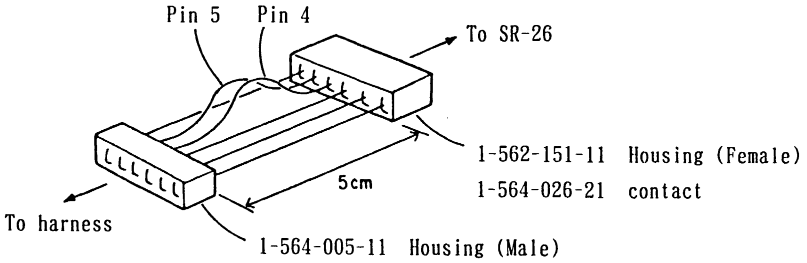
machine conditions for adjustment	specifications	adjustments
• Play back a monoscope signal on alignment tape CR5-2A PS.	CN208-15B/SV-84P(E-9)  A: Minimize.	⊘RV100/SV-84P(D-1) ⊘RV101/SV-84P(E-2)

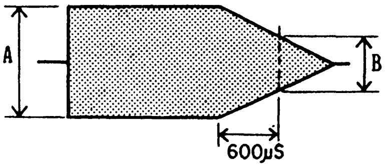
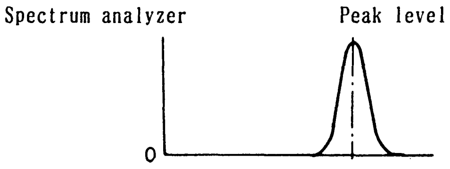
10-19. CONFI HEAD Y SWITCHING POSITION ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Set the setup menu *ITEM 907 to 1. • CONFI sw: on • S101-Bit 4/SV-82: ON • S1/SV-83A: ON • Insert alignment tape CR2-1B PS and put the unit into the PLAY mode. • Set the TRACKING control to the center click position. • After adjustment is completed, set S101-Bit4 on the SV-82 board, S1 on the SV-83A board and CONFI switch to the former position and set the setup menu *ITEM 907 to 0.	 TP901/DM-56P(C-1) TP205/DM-56P(B-1) A Minimize A. (20 µsec or less)	⊘RV203/SV-83A(D-3) TRIG (+): TP901/DM-56P(C-1)
	 TP901/DM-56P(C-1) TP205/DM-56P(B-1) A Minimize A. (20 µsec or less)	⊘RV204/SV-83A(D-3) TRIG (-): TP901/DM-56P(C-1)
	 TP901/DM-56P(C-1) TRIG(+) A TRIG(-) Minimize A. (5 µsec or less) Select the TRIG SLOPE (+/-) and check that the phase difference satisfies the specification.	• Fine adjustment ⊘RV203/SV-83A(D-3) ⊘RV204/SV-83A(D-3) TRIG: TP901/DM-56P(C-1)

10-20. ROTARY ERASE CURRENT ADJUSTMENT

- For the rotary erase current adjustment, prepare the following extension harnesses for measuring;


Pin 5
Pin 4
To SR-26
1-562-151-11 Housing (Female)
1-564-026-21 contact
5cm
To harness
1-564-005-11 Housing (Male)

machine conditions for adjustment	specifications	adjustments
Step 1 • VIDEO IN: Color-bar signal • INPUT SELECT sw: COMPOSITE • Remove connector CN662 on the SR-26 board and connect the above extension harness between CN662 and harness. • Connect a current probe to pins 4 and 5 of the extension harness. • Insert the BCT-20G cassette. • Push the VIDEO INSERT button and push the EDIT and PLAY buttons simultaneously.	4-pin harness/extension harness 5-pin harness/extension harness  A = 250 ± 4 mAp-p B = $55 \pm {}^{5}_{10}$ % (A = 100 %)  Frequency = 10 ± 0.5 MHz	CH-A Current ⊘RV1/RE-34(B-1) Frequency ⊘LV1/RE-34(B-1) CH-B Current ⊘RV2/RE-34(A-1) Frequency ⊘LV2/RE-34(B-1)
Step 2 • Push the VIDEO INSERT button and push the ASSEMBLE button. • After adjustment is completed, remove the extension harness and connect connecter CN662.	Disappear the waveform about 6 seconds later.	

SECTION 11
AUDIO/TIME CODE ALIGNMENT

【Equipment Required】
- Audio oscillator
- Audio attenuator
- Vacuum voltmeter
- Spectrum analyzer
- Oscilloscope
- Level meter
- Alignment tapes CR8-1B PS, CR8-1A PS and CR5-1B PS

CR8-1A PS (8-960-098-45) Contents

TIME min, sec	AUDIO TRACK
0:00	1kHz, 0 VU
2:55	Blank
3:00	10kHz, -10 VU
4:55	Blank
5:00	1kHz, -20 VU
5:55	Blank
6:00	40, 7k, 10k, 15kHz
7:55	Blank
8:00	1kHz, 0 VU
10:00	

CR5-1B PS (8-960-096-91) Contents

TIME min, sec	VIDEO TRACK	AFM
0:00	RF Sweep Marker 1, 2, 4, 6, 8, 10, 12 MHz	No-Signal
2:00	60% H. Sweep (CTDM) Marker 0.5, 1, 2, 3, 4, 5 MHz	
5:00	Pulse & Bar (CTDM)	
8:00	Multi Burst Y:0.5, 1, 2, 4, 5, 5.5 MHz C:0.2, 0.5, 1, 1.5, 2 MHz	
11:00	Pulse & Bar	
14:00	100% Color Bars	400Hz Sine Wave 25kHz Deviation
16:30		75kHz Deviation
17:00	50% Bowtie & 10T	No-Signal
19:00	Line 17A Signal	
22:00	Quad Phase	
24:00	Flat Field	
26:00	100% Color Bars with Dropout	
28:00	Composite H. Sweep with VISC	
30:00		

CR8-1B PS (8-960-096-86) Contents

TIME min, sec	AUDIO TRACK	VIDEO TRACK	CTL TRACK
00:00	1 kHz 0VU	Black Burst	CTL
02:30	Blank (only Bias)	Black Burst	CTL
03:00	15 kHz 0VU	Black Burst	CTL
05:00	1 kHz -20VU	Black Burst	CTL
06:00	40 Hz -20VU 7 kHz -20VU 10 kHz -20VU 15 kHz -20VU	Black Burst	CTL
08:00 10:00	1 kHz 0VU	————	1 kHz sine wave

【Switch Setting】

- Function Control Panel
  CONFI switch : OFF
  PB. PB/EE switch : PB/EE
  CTL/TC/U-BIT switch : CTL
- Level Control Panel
  AUDIO MONITOR switch : ST/MIX
  AUDIO MONITOR switch : LNG
  AUDIO LIMITER switch : OFF
  AUDIO MIXING switch : OFF
  TRACKING control : FIXED
  REMOTE/LOCAL switch : LOCAL
- Subcontrol Panel
  AFM INPUT switch : CH-1/-2
  AUDIO MONITOR switch : ST
  DOLBY NR switch : OFF
  TBC control switch : INT
  VIDEO switch : PRESET
  CHROMA switch : PRESET
  SET UP switch : PRESET
  Y/C DELAY switch : PRESET
  HUE switch : PRESET
  TBC BYPASS switch : OFF
  VIDEO INPUT switch : AUTO
  REC INHIBIT switch : OFF
  CAPSTAN LOCK switch : 2/4FD
- Connector Panel
  REF VIDEO switch : AUTO
  REF VIDEO 75Ω termination : ON
  AUDIO CH-1 LEVEL switch : HIGH
  AUDIO CH-1 600Ω switch : OFF
  AUDIO CH-2 LEVEL switch : HIGH
  AUDIO CH-2 600Ω switch : OFF
  AUDIO CH-3 LEVEL switch : HIGH
  AUDIO CH-3 600Ω switch : OFF
  AUDIO CH-4 LEVEL switch : HIGH
  AUDIO CH-4 600Ω switch : OFF

【Blank Tape】

The "Blank Tape" described in the adjustment item indicates the tape on which no video and audio signals are recorded.

【Audio System Adjustment Procedure】

For LNG audio system adjustment, make adjustments in the order of Sections 11-1 through 11-34.

For AFM audio system adjustment, make adjustments in the order of Sections 11-35 through 11-46.

【System setup】

- System setup menu ITEM 901: 1
- After adjustment is completed, set system setup menu ITEM 901 to "0".

* Item 900 Series

For setting, refer to the Setup in 1-7-1. To display this item, turn the SEARCH dial while pressing the PLAY button.

Note: Item 900 series are used only at the factory. Setting should not be thus changed. When setting is changed, be sure to return it to the initial value.

11-1. REC LEVEL ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Supply a 1kHz signal (4dBs) to the AUDIO IN CH-1/CH-2 connector. • MODE: EE	CH-1: TP103/AU-75P(H-1) CH-2: TP203/AU-75P(G-1) −10 ± 0.1 dBs	CH-1: ⊘RV101/BF-28(A-5) (Panel display: CH-1 REC VR) CH-2: ⊘RV201/BF-28(A-4) (Panel display: CH-2 REC VR)

11-2. LINE OUT LEVEL ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Supply a 1kHz signal (4dBs) to the AUDIO IN CH-1/CH-2 connector. • MODE: EE	CH-1: TP103/AU-76P(D-1) CH-2: TP203/AU-76P(D-1) −10 ± 0.1 dBs	CH-1: ⊘RV105/AU-76P(C-6 or C-7) CH-2: ⊘RV205/AU-76P(B-6 or B-7)

11-3. OUTPUT LEVEL ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Supply a 1kHz signal (4dBs) to the AUDIO IN CH-1/CH-2 connector. • MODE: EE	AUDIO OUT CH-1 connector (Terminated in 600 ohms.) AUDIO OUT CH-2 connector (Terminated in 600 ohms.) +4 ± 0.1 dBm	CH-1: ⊘RV101/CP-161A(A-1) ⊘RV151/CP-111(B-2) CH-2: ⊘RV201/CP-161A(B-1) ⊘RV251/CP-111(B-1)

11-4. MONITOR OUT LEVEL ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Supply a 1kHz signal (4dBs) to the AUDIO IN CH-1/CH-2 connector. • MODE: EE • Insert the BCT-20G cassette. • Set System Setup Item 103 to 1. • After adjustment is completed, set Item 103 to 0.	AUDIO OUT CH-1/CH-3 connector (Terminated in 600 ohms.) AUDIO OUT CH-2/CH-4 connector (Terminated in 600 ohms.) +4 ± 0.1 dBm	CH-1, CH-3: ⊘RV501/CP-161A(E-1) ⊘RV551/CP-111(F-2) CH-2, CH-4: ⊘RV601/CP-161A(F-1) ⊘RV651/CP-111(E-1)

11-5. LIMITER LEVEL ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• AUDIO INPUT LEVEL sw: LOW • AUDIO LIMITER sw: ON • Supply a 1kHz signal (-30dBs) to the AUDIO IN CH-1/CH-2 connector. • MODE: EE • After adjustment is completed, set the AUDIO INPUT LEVEL switch to HIGH and the AUDIO LIMITER switch to OFF.	AUDIO OUT CH-1 connector (Terminated in 600 ohms.) AUDIO OUT CH-2 connector (Terminated in 600 ohms.) 12 ± 0.5 dBm	CH-1: ⊘RV107/AU-75P(H-9) CH-2: ⊘RV207/AU-75P(F-9)

11-6. REC/PB DOLBY NR SKEWING ADJUSTMENT (Up to S/N 14309)

machine conditions for adjustment	specifications	adjustments
• Supply a 1 ± 0.1 kHz signal (-26dBs) to TP101/E101(CH-1) and TP201/E201(CH-2) on the AU-75P board. • MODE: EE • DOLBY NR sw: ON	CH-1: TP103/AU-75P(H-1) CH-2: TP203/AU-75P(G-1) −10 ± 0.1 dBs	Finely tune using an audio oscillator or attenuator.
• DOLBY NR sw: ON • Supply a 17 ± 0.05 kHz signal (-26dBs) to TP101/E101(CH-1) and TP201/E201(CH-2) on the AU-75P board. • After adjustment is completed, set the DOLBY NR switch to OFF.	CH-1: TP103/AU-75P(H-1) CH-2: TP203/AU-75P(G-1) −18.3 ± 0.1 dBs	CH-1: ⊘LV101/AU-75P(J-5) CH-2: ⊘LV201/AU-75P(E-5)

11-7. R/P HEAD PB FREQUENCY RESPONSE ADJUSTMENT (DOLBY OFF)

11-7-1. Oxide R/P Head PB Frequency Response Adjustment (DOLBY OFF)

machine conditions for adjustment

- DOLBY NR sw: OFF
- S301/AU-76P: OFF
- Play back 40Hz, 1kHz, 7kHz, 10kHz, and 15kHz signals on alignment tape CR8-1A PS.

Note: Setting of S102 and S202 on the AU-76P board should be the same position.

specifications

AUDIO OUT CH-1 connector (Terminated in 600 ohms.)
AUDIO OUT CH-2 connector (Terminated in 600 ohms.)

Freq	Level
40Hz	Ref. $\pm\,^{0.7}_{2.5}$dB
1kHz	Ref.
7kHz	Ref. ± 0.3dB
10kHz	Ref. ± 0.5dB
15kHz	Ref. ± 0.5dB

If the specification is not satisfied, set the switches as described below, then readjust.

- When the high-frequency level is higher than the specified value.
  Set and readjust the switches so that the level is lower.
- When the high-frequency level is lower than the specified value.
  Set and readjust the switches so that the level is Higher.

High-frequency level goes low. ↔ High-frequency level goes high.

Bit-4	0	0	0	0	0	0	0	0	1	1	1
Bit-3	0	0	0	0	1	1	1	1	1	1	1
Bit-2	0	0	1	1	0	0	1	1	0	0	1
Bit-1	0	1	0	1	0	1	0	1	0	1	1

0:SW OFF
1:SW ON

↑
Preset position

adjustments

- 3kHz, 7kHz adjustment
  CH-1:
  ⊘RV111/AU-76P(E-1)
  CH-2:
  ⊘RV211/AU-76P(F-1)
- 10kHz, 15kHz adjustment
  CH-1:
  ⊘RV110/AU-76P(D-3)
  CH-2:
  ⊘RV210/AU-76P(E-3)

CH-1:
S102/AU-76P(D-3)
CH-2:
S202/AU-76P(E-3)

11-7-2. Metal R/P Head PB Frequency Response Adjustment (DOLBY OFF)

<table>
<tr><th>machine conditions for adjustment</th><th>specifications</th><th>adjustments</th></tr>
<tr>
<td>• DOLBY NR sw: OFF
• S301/AU-76P: OFF
• Play back 1kHz, 10kHz, and 15kHz signals on alignment tape CR8-1BPS.</td>
<td>AUDIO OUT CH-1 connector (Terminated in 600 ohms.)
AUDIO OUT CH-2 connector (Terminated in 600 ohms.)
<table>
<tr><th>Freq.</th><th>Level</th></tr>
<tr><td>1kHz</td><td>Ref.</td></tr>
<tr><td>10kHz</td><td>Ref. ± 0.3dB</td></tr>
<tr><td>15kHz</td><td>Ref. $\pm^{0.5}_{0.7}$dB</td></tr>
</table>
If the specification is not satisfied, readjust Section 11-8-1.</td>
<td>CH-1:
⊘RV114/AU-76P(E-2)
CH-2:
⊘RV214/AU-76P(F-2)</td>
</tr>
</table>

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11-8. CONFI HEAD PB FREQUENCY RESPONSE TENTATIVE ADJUSTMENT (DOLBY OFF)

machine conditions for adjustment

- DOLBY NR sw: OFF
- S301/AU-76P: ON
- Play back 40Hz, 1kHz, 7kHz, 10kHz, and 15kHz signals on alignment tape CR8-1A PS.

Note: Setting of S101 and S201 on the AU-76P board should be the same position.

- After adjustment is completed, set S301 on the AU-76P board to OFF.

specifications

AUDIO OUT CH-1 connector (Terminated in 600 ohms.)
AUDIO OUT CH-2 connector (Terminated in 600 ohms.)

Freq	Level
40Hz	Ref. $\pm^{0.7}_{2.5}$dB
1kHz	Ref.
7kHz	Ref. ± 0.5dB
10kHz	Ref. ± 0.5dB
15kHz	Ref. ± 1 dB

If the specification is not satisfied, set the switches as described below, then readjust.

- When the high-frequency level is higher than the specified value.
  Set and readjust the switches so that the level is lower.
- When the high-frequency level is lower than the specified value.
  Set and readjust the switches so that the level is Higher.

High-frequency level goes low. ←→ High-frequency level goes high.

Bit-4	0	0	0	0	0	0	0	0	1	1	1
Bit-3	0	0	0	0	1	1	1	1	1	1	1
Bit-2	0	0	1	1	0	0	1	1	0	0	1
Bit-1	0	1	0	1	0	1	0	1	0	1	1

0:SW OFF
1:SW ON

↑
Preset position

adjustments

- 3kHz, 7kHz adjustment
  CH-1:
  ⊘RV102/AU-76P(E-8)
  CH-2:
  ⊘RV202/AU-76P(F-8)
- 10kHz, 15kHz adjustment
  CH-1:
  ⊘RV101/AU-76P(D-7)
  CH-2:
  ⊘RV201/AU-76P(F-7)

CH-1:
S101/AU-76P(D-8)
CH-2:
S201/AU-76P(F-8)

11-9. R/P HEAD PB LEVEL ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Play back a 1kHz signal on alignment tape CR8-1B PS.	CH-1: TP103/AU-75P(H-1), E102/AU-75P(D-1) CH-2: TP203/AU-75P(G-1), E202/AU-75P(B-1) −10 ± 0.2 dBs	CH-1: ⊘RV112/AU-76P(D-1) CH-2: ⊘RV212/AU-76P(F-1)
	AUDIO OUT CH-1 connector (Terminated in 600 ohms.) AUDIO OUT CH-2 connector (Terminated in 600 ohms.) +4 ± 0.2 dBm	CH-1: ⊘RV102/BF-28(A-4) (Panel display: CH-1 PB VR) CH-2: ⊘RV202/BF-28(A-3) (Panel display: CH-2 PB VR)

11-10. CONFI HEAD PB LEVEL TENTATIVE ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• S301/AU-76P: ON • Play back a 1kHz signal on alignment tape CR8-1B PS.	CH-1: TP102/AU-76P(D-6), E101/AU-76P(D-7) CH-2: TP202/AU-76P(F-6), E201/AU-76P(F-7) −10 ± 0.2 dBs	CH-1: ⊘RV103/AU-76P(D-7) CH-2: ⊘RV203/AU-76P(F-7)
• After adjustment is completed, set S301 on the AU-76P board to OFF.	AUDIO OUT CH-1 connector (Terminated in 600 ohms.) AUDIO OUT CH-2 connector (Terminated in 600 ohms.) +4 ± 0.2 dBm	CH-1: ⊘RV104/AU-76P(C-7) CH-2: ⊘RV204/AU-76P(B-7)

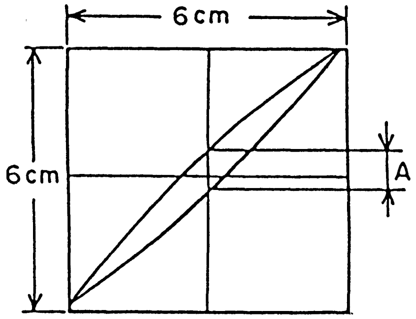
11-11. ERASE FREQUENCY ADJUSTMENT (Up to S/N 14309)

machine conditions for adjustment	specifications	adjustments
• Insert the BCT-20M cassette and put the unit into the REC mode.	TP1/TC-40P(B-5) TP2/TC-40P(A-5) TP3/TC-40P(C-5) 82 ± 1 kHz	⊘RV4/TC-40P(B-1)

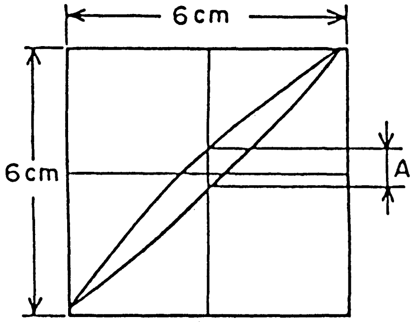
11-11. ERASE FREQUENCY ADJUSTMENT (S/N 14310 and Higher)

machine conditions for adjustment	specifications	adjustments
• Insert the BCT-20M cassette and put the unit into the REC mode. • Connect the frequency counter to TP3.	TP3/TC-40P(C-5) E401/TC-40P(C-5) 53.6 ± 0.5 kHz	⊘RV4/TC-40P(B-1)

11-12. CONFI HEAD PB PHASE ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• S301/AU-76P: ON • DOLBY NR sw: OFF • Play back a 10kHz signal on alignment tape CR8-1A PS. • Display the lissajous's waveform. • After adjustment is completed, set S301 on the AU-76P board to OFF.	AUDIO OUT CH-1 connector (Terminated in 600 ohms.) AUDIO OUT CH-2 connector (Terminated in 600 ohms.)  A ≦ 0.5 cm (Within ± 5°)	CH-1: ⊘RV115/AU-76P(C-7) CH-2: ⊘RV215/AU-76P(B-7)

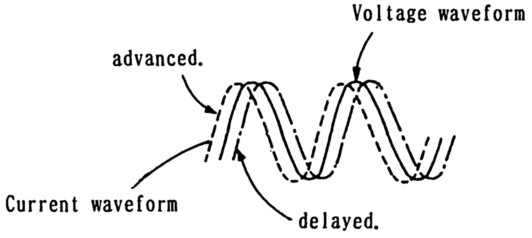
11-13. R/P HEAD PB PHASE ADJUSTMENT

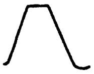
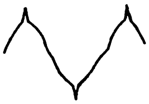
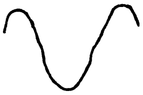
machine conditions for adjustment	specifications	adjustments
• DOLBY NR sw: OFF • Play back a 10kHz signal on alignment tape CR8-1A PS. • Display the lissajous's waveform.	AUDIO OUT CH-1 connector (Terminated in 600 ohms.) AUDIO OUT CH-2 connector (Terminated in 600 ohms.)  A ≦ 0.5 cm (Within ± 5°)	CH-1: ⊘RV811/AU-75P(G-7) CH-2: ⊘RV821/AU-75P(G-7)

11-14. FULL ERASE OSCILLATION FREQUENCY CHECK

machine conditions for adjustment	specifications	adjustments
• Insert the BCT-20M cassette and put the unit into the REC mode.	TP7/TC-40P(C-4) 60 ± 10 kHz	

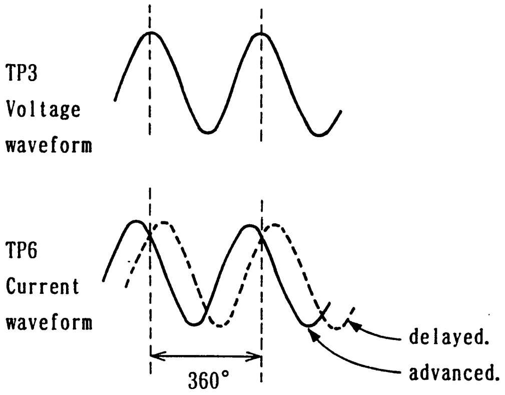
11-15. ERASE CURRENT ADJUSTMENT (Up to S/N 14309)

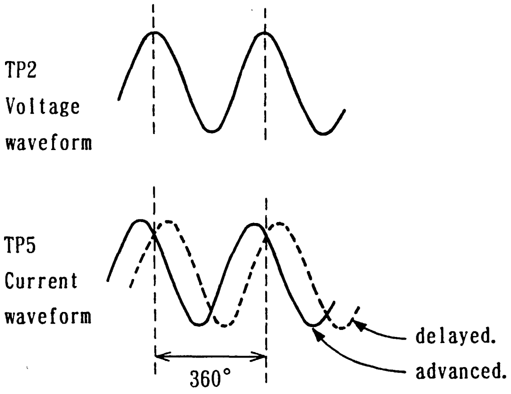
machine conditions for adjustment	specifications	adjustments
Step 1 (CH-1 ERASE) • Insert the BCT-20M blank cassette and put the unit into the AUDIO CH-1 INSERT mode.	Voltage: TP3/TC-40P(C-5) Current: TP6/TC-40P(B-6) E401/TC-40P(C-5)  Voltage waveform advanced. Current waveform delayed. Specification same phase.	S3-1: ON (preset) • For phase advance, set ON S3-3, S3-2, and both S3-3 and S3-2 to ON in order. • For phase delay, set S3-1 to OFF, then set both S3-2 and S3-3, S3-2 and S3-3 to ON.
Step 2 (CH-2 ERASE) • Insert the BCT-20M blank cassette and put the unit into the AUDIO CH-2 INSERT mode.	Voltage: TP2/TC-40P(A-5) Current: TP5/TC-40P(A-6) E401/TC-40P(C-5) Specification same phase.	S2-1: ON (preset) • For phase advance, set S2-3, S2-2, and both S2-2 and S2-3 to ON. • For phase delay, set S2-1 to OFF, then set both S2-2 and S2-3, S2-2 and S2-3 to ON.
Step 3 (TC ERASE) • Insert the BCT-20M blank cassette and put the unit into the REC mode.	Voltage: TP1/TC-40P(B-5) Current: TP4/TC-40P(B-6) E401/TC-40P(C-5) Specification same phase.	S1-1: ON (preset) • For phase advance, set S1-2 to ON. • For phase delay, set S1-1 to OFF, then set S1-2 to ON.

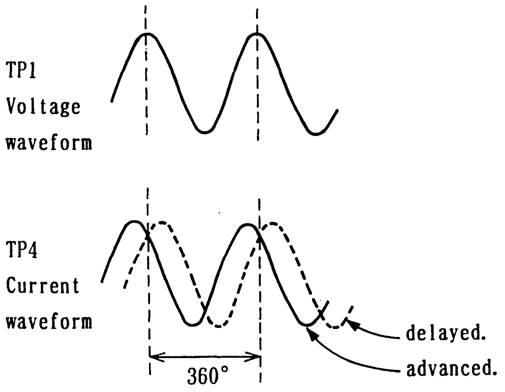
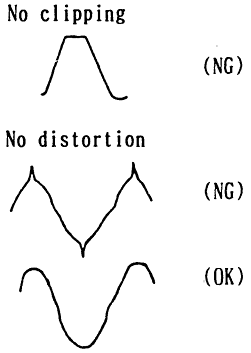
Step 4 (FULL ERASE CURRENT) • Insert the BCT-20M blank cassette and put the unit into the REC mode.	VTVM: TP7/TC-40P(C-4) E1/TC-40P(B-6) 140 ± 10 mV Oscilloscope: TP7/TC-40P(C-5) E1/TC-40P(B-6) No clipping  (NG) No distortion  (NG)  (OK) No waveform distortion should appear.	⊘RV5/TC-40P(D-5)
Step 5 (CH-1 ERASE CURRENT) • Insert the BCT-20M blank cassette and put the unit into the AUDIO CH-1 INSERT mode.	VTVM: TP6/TC-40P(B-6) E401/TC-40P(C-5) 170 mV Oscilloscope: TP3/TC-40P(B-6) E401/TC-40P(C-5) No waveform distortion should appear.	⊘RV1/TC-40P(C-2)
Step 6 (CH-2 ERASE CURRENT) • Insert the BCT-20M blank cassette and put the unit into the AUDIO CH-2 INSERT mode.	VTVM: TP5/TC-40P(A-6) E401/TC-40P(C-5) 170 mV Oscilloscope: TP2/TC-40P(A-6) E401/TC-40P(C-5) No waveform distortion should appear.	⊘RV2/TC-40P(C-2)

Step 7 - Put the unit into the AUDIO CH-1/CH-2 INSERT mode.	VTVM: TP6/TC-40P(B-6) TP5/TC-40P(A-6) Adjust so that the voltage (current) at TP5 is the same as that at TP6.	⊘RV6/TC-40P(C-2)
Step 8 (TC ERASE CURRENT) - Insert the BCT-20M blank cassette and put the unit into the REC mode.	VTVM: TP4/TC-40P(B-6) E401/TC-40P(C-5) 160 ± 10 mV Oscilloscope: TP1/TC-40P(B-5) E401/TC-40P(C-5) No waveform distortion should appear.	⊘RV3/TC-40P(A-1)

11-15. ERASE CURRENT ADJUSTMENT (S/N 14310 and Higher)

machine conditions for adjustment	specifications	adjustments
Step 1 (CH-1 Erase Current Phase) • Insert the BCT-20M cassette and put the unit into the AUDIO CH-1 INSERT mode.	• Scope CH-1: Voltage: TP3/TC-40P(C-5) E401/TC-40P(C-5) • Scope CH-2: Current: TP6/TC-40P(B-6) E1/TC-40P(B-6)  TP3 Voltage waveform TP6 Current waveform 360° delayed. advanced. The phase of TP6 advances against to it of TP3 about 0 degree thru. 15 degrees. TP3 is the reference waveform. If the specification is not met even if S3-Bit1, Bit-2 and Bit-3 are set to all ON, solder a capacitor 0.018 uF (part No. 1-130-486-11) in parallel with C75(C-5) and perform the adjustment again.	S3-1/TC-40P(B-5) S3-2/TC-40P(B-5) S3-3/TC-40P(B-5)

Step 2 (CH-2 Erase Current Phase) • Insert the BCT-20M cassette and put the unit into the AUDIO CH-2 INSERT mode.	• Scope CH-1: Voltage: TP2/TC-40P(A-5) E401/TC-40P(C-5) • Scope CH-2: Current: TP5/TC-40P(A-6) E1/TC-40P(B-6)  TP2 Voltage waveform TP5 Current waveform 360° delayed. advanced. The phase of TP5 advances against to it of TP2 about 0 degree thru. 15 degrees. TP2 is the reference waveform. If the specification is not met even if S2-Bit1, Bit-2 and Bit-3 are set to all ON, solder a capacitor 0.015 uF (part No. 1-130-485-11) in parallel with C74(A-5) and perform the adjustment again.	S2-1/TC-40P(A-5) S2-2/TC-40P(A-5) S2-3/TC-40P(A-5)

Step 3 (TC Erase Current Phase) • Insert the BCT-20M cassette and put the unit into the TC INSERT mode.	• Scope CH-1: Voltage: TP1/TC-40P(B-5) E401/TC-40P(C-5) • Scope CH-2: Current: TP4/TC-40P(B-6) E1/TC-40P(B-5)  TP1 Voltage waveform TP4 Current waveform delayed. advanced. 360° The phase difference between TP4 and TP1 is zero degree (same phase) or within ± 15 degrees. TP1 is the reference waveform. If the specification is not met even if S1-Bit1, and Bit-2 are set to all ON, solder a capacitor 0.012 uF (part No. 1-130-484-11) or 0.027 uF (part No. 1-130-488-11) in parallel with C47(B-5) and perform the adjustment again.	S1-1/TC-40P(B-5) S1-2/TC-40P(B-5)
Step 4 (Full Erase Current) • Insert the BCT-20M blank cassette and put the unit into the REC mode.	VTVM: TP7/TC-40P(C-4) E1/TC-40P(B-6) 140 ± 10 mV Oscilloscope: TP7/TC-40P(C-5) E1/TC-40P(B-6)  No clipping (NG) No distortion (NG) (OK) No waveform distortion should appear.	⊘RV5/TC-40P(D-5)

Step 5 (CH-1 Erase Current) • Insert the BCT-20M cassette and put the unit into the AUDIO CH-1 INSERT mode.	AC Voltmeter TP6/TC-40P(B-6) E1/TC-40P(B-6) 155 ± 5 mVrms	⊘RV1/TC-40P(C-2)
Step 6 (CH-2 Erase Current) • Insert the BCT-20M cassette and put the unit into the AUDIO CH-2 INSERT mode.	AC Voltmeter TP5/TC-40P(A-6) E1/TC-40P(B-6) 155 ± 5 mVrms	⊘RV2/TC-40P(B-1)
Step 7 (CH-1/CH-2 Erase Current) • Insert the BCT-20M cassette and put the unit into the AUDIO CH-1/CH-2 INSERT mode.	AC Voltmeter CH-1: TP6/TC-40P(B-6) E1/TC-40P(B-6) CH-2: TP5/TC-40P(A-6) E1/TC-40P(B-6) 155 ± 5 mVrms	⊘RV6/TC-40P(C-2)
Step 8 (TC Erase Current) • Insert the BCT-20M cassette and put the unit into the TC INSERT mode.	AC Voltmeter TP4/TC-40P(B-6) E1/TC-40P(B-6) 110 ± 5 mVrms	⊘RV3/TC-40P(C-2)

Adjustment Technique of CH-1/CH-2 Erase Current

- Adjust RV6 so that TP6 and TP5 are the same voltage.
  If not to meet the specification, perform the current phase adjustment in Sec. 11-15, Step 1, 2 and Erase Head Tuning Adjustment as the following conditions.

Erase Current	Adjustment Technique
TP6: 140 mV or more TP5: 140 mV or more	Re-adjust Step 1 and Step 2 of Sec. 11-15 so that both phase differences of TP6 against TP3, and TP5 against TP2 make to large, and perform Sec. 11-15, Step 5, 6, 7 again.
TP6: 130 mV or less TP5: 130 mV or less	Re-adjust Step 1 and Step 2 of Sec. 11-15 so that both phase differences of TP6 against TP3, and TP5 against TP2 make to small, and perform Sec. 11-15, Step 5, 6, 7 again.

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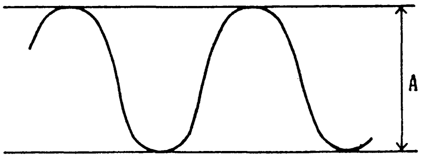
11-16. BIAS OSCILLATION FREQUENCY ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Insert the BCT-20M blank cassette and put the unit into the REC mode. • No signal input.	TP302/AU-76P(B-4) E302/AU-76P(A-4) 134 ± 0.5kHz	⊘RV301/AU-76P(B-4)

11-17. BIAS OSCILLATION LEVEL ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Insert the BCT-20M blank cassette and put the unit into the REC mode.	TP302/AU-76P(B-4)  A = 16.0 ± 0.7 Vp-p	⊘RV302/AU-76P(B-4)

※ After adjustment is completed, make Section 11-16 Bias Oscillation Frequency Adjustment again.

11-18. HEAD TUNING ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Insert the BCT-20M blank cassette and put the unit into the REC mode.	CH-1: TP105, TP106(GND)/AU-76P(E-3) CH-2: TP205, TP206(GND)/AU-76P(F-3) Maximize the level.	CH-1: ⊘T501/AU-76P(B-2) CH-2: ⊘T601/AU-76P(A-2)

11-19. BIAS TRAP ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Insert the BCT-20M blank cassette and put the unit into the REC mode. • No signal input	CH-1: TP104/AU-76P(E-4), E103/AU-76P(E-5) CH-2: TP204/AU-76P(F-4), E203/AU-76P(G-5) Minimize the level. (Should be +14.0 dBs or less.)	CH-1: ⊘LV103/AU-76P(E-3) CH-2: ⊘LV203/AU-76P(F-3)

11-20. CONFI BIAS TRAP ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Insert the BCT-20M blank cassette and put the unit into the REC mode. cassette and put the unit into the REC mode. • No signal input	CH-1: TP108/AU-76P(D-8), E101/AU-76P(D-6) CH-2: TP208/AU-76P(E-7), E201/AU-76P(F-7) Minimize the level. (Should be -10.0 dBs or less.)	CH-1: ⊘LV102/AU-76P(D-7) CH-2: ⊘LV102/AU-76P(D-7) CH-2: ⊘LV202/AU-76P(F-7)

11-21. BIAS TRAP ADJUSTMENT (INSERT MODE)

machine conditions for adjustment	specifications	adjustments
• Insert the BCT-20M blank cassette, then press the AUDIO CH-1 INSERT, PLAY, and EDIT buttons. (CH-1 AUDIO INSERT MODE) • Set the AUDIO CH-2 INSERT button to OFF. • No signal input.	TP207/AU-76P(F-1) E204/AU-76P(F-1) Minimize the level. (Should be -3.0 dBs or less.)	⊘LV204/AU-76P(F-3)
• Press the AUDIO CH-2 INSERT, PLAY, EDIT buttons. (CH-2 AUDIO INSERT MODE) • Set the AUDIO CH-1 INSERT button to OFF. • No signal input.	TP107/AU-76P(E-1) E104/AU-76P(E-1) Minimize the level. (Should be -3.0 dBs or less.)	⊘LV104/AU-76P(E-3)

11-22. RECORDING BIAS CURRENT ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Insert the BCT-20G blank cassette and put the unit into the REC mode. • No extension board should be used.	TP105, TP106(GND)/AU-76P(E-3) TP205, TP206(GND)/AU-76P(F-3) 8.0 ± 0.1 mVrms	CH-1: ⊘RV502/AU-76P(C-1) CH-2: ⊘RV602/AU-76P(B-1)
• Insert the BCT-20M blank cassette and put the unit into the REC mode. • No extension board should be used.	TP105, TP106(GND)/AU-76P(E-3) TP205, TP206(GND)/AU-76P(F-3) CH-1 = 18.0 ± 0.1 mVrms CH-2 = 18.0 ± 0.1 mVrms	CH-1: ⊘RV501/AU-76P(C-1) CH-2: ⊘RV601/AU-76P(B-1)

11-23. OXIDE TAPE OVERALL FREQUENCY RESPONSE ADJUSTMENT (DOLBY OFF)

<table>
<tr><th>machine conditions for adjustment</th><th>specifications</th><th>adjustments</th></tr>
<tr>
<td>• Check that the subcontrol panel DOLBY NR switch is set to OFF.
• Connect an oscillator to the AUDIO IN CH-1/2 connector.
• Insert the BCT-20G cassette and put the unit into the REC mode.
• Set the oscillator frequency level to 40Hz, 1kHz, 7kHz, 10kHz and 15kHz at -16dBs and record each frequency for approx. 10 seconds.
• Play back the recorded tape.
• No extension board should be used for AU-76P board.</td>
<td>AUDIO OUT CH-1 connector (Terminated in 600 ohms.)
AUDIO OUT CH-2 connector (Terminated in 600 ohms.)
<table>
<tr><th>Freq.</th><th>Level</th></tr>
<tr><td>40Hz</td><td>0 ± $^{1.5}_{2.7}$ dB</td></tr>
<tr><td>1kHz</td><td>0 (Ref.)</td></tr>
<tr><td>7kHz</td><td>0 ± 0.5dB</td></tr>
<tr><td>10kHz</td><td>0 ± 0.5dB</td></tr>
<tr><td>15kHz</td><td>0 ± 0.7dB</td></tr>
</table>
When the specification is not satisfied, put the unit into the REC mode again and adjust using each variable resistor.</td>
<td>CH-1:
⊘RV102/AU-75P(G-1)
⊘LV102/AU-75P(G-2)
CH-2:
⊘RV202/AU-75P(F-1)
⊘LV202/AU-75P(E-2)
• When only 15kHz does not satisfy level.
CH-1:
⊘RV502/AU-76P(C-1)
CH-2:
⊘RV602/AU-76P(B-1)</td>
</tr>
</table>

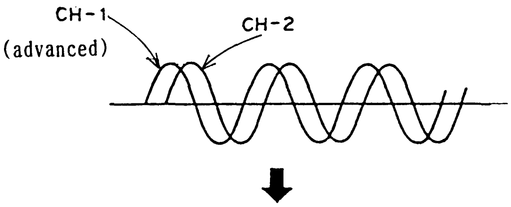
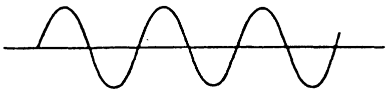
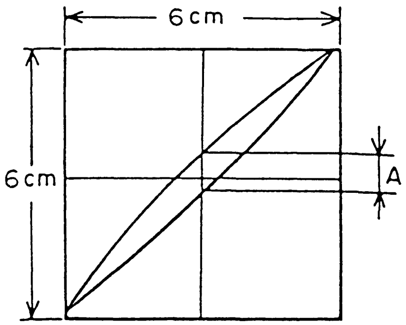
[• Frequency response adjustment
When the above frequency does not satisfy the specification, adjust using each variable resistor in the REC CONFI mode.]

11-24. METAL TAPE OVERALL FREQUENCY RESPONSE ADJUSTMENT (DOLBY OFF)

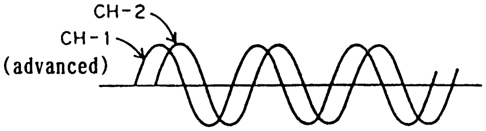
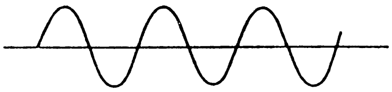
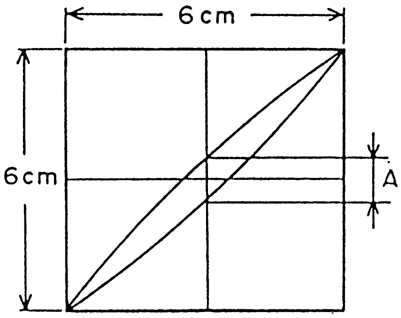
<table>
<tr><th>machine conditions for adjustment</th><th>specifications</th><th>adjustments</th></tr>
<tr>
<td>• Check that the subcontrol panel DOLBY NR switch is set to OFF.
• Connect an oscillator to the AUDIO IN CH-1/2 connector.
• Insert the BCT-20M cassette and put the unit into the REC mode.
• Set the oscillator frequency level to 40Hz, 1kHz, 7kHz, 10kHz and 15kHz at -16dBs and record each frequency for approx. 10 seconds.
• Play back the recorded tape.
• No extension board should be used for AU-76P board.</td>
<td>AUDIO OUT CH-1 connector (Terminated in 600 ohms.)
AUDIO OUT CH-2 connector (Terminated in 600 ohms.)
<table>
<tr><th>Freq.</th><th>Level</th></tr>
<tr><td>40Hz</td><td>$0 \pm ^{1.0}_{2.0}$dB</td></tr>
<tr><td>1kHz</td><td>0 (Ref.)</td></tr>
<tr><td>7kHz</td><td>0 ± 0.5dB</td></tr>
<tr><td>10kHz</td><td>0 ± 0.5dB</td></tr>
<tr><td>15kHz</td><td>0 ± 0.5dB</td></tr>
</table>
When the specification is not satisfied, put the unit into the REC mode again and adjust using each variable resistor.</td>
<td>CH-1:
⊘RV105/AU-75P(D-1)
⊘LV103/AU-75P(C-2)
CH-2:
⊘RV205/AU-75P(B-1)
⊘LV203/AU-75P(B-2)</td>
</tr>
</table>

[• Frequency response adjustment
When the above frequency does not satisfy the specification, adjust using each variable resistor in the REC CONFI mode.]

11-25. OXIDE TAPE OVERALL PHASE ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
Step 1 • Supply a 15kHz signal(+4dBs) to the AUDIO IN CH-1/2 connector. • Insert the BCT-20G blank cassette and put the unit into the REC mode. • CONFI sw: ON	AUDIO OUT CH-1 connector (Terminated in 600 ohms.) AUDIO OUT CH-2 connector (Terminated in 600 ohms.) Adjust the advanced channel so that the both phases are aligned.  Align the phase of CH-1 with that of CH-2. 	CH-1: ⊘RV103/AU-75P(G-2) CH-2: ⊘RV203/AU-75P(E-1)
Step 2 • Play back the recorded tape in Step 1. • Display the lissajous's waveform.	AUDIO OUT CH-1 connector (Terminated in 600 ohms.) AUDIO OUT CH-2 connector (Terminated in 600 ohms.)  A ≦ 0.5 cm (Within ± 5°) Repeat Steps 1 and 2 until Step 2 is satisfied.	

11-26. METAL TAPE OVERALL PHASE ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
Step 1 - Supply a 15kHz signal(+4dBs) to the AUDIO IN CH-1/2 connector. - Insert the BCT-20M and put the unit into the REC mode. - CONFI sw: ON	AUDIO OUT CH-1 connector (Terminated in 600 ohms.) AUDIO OUT CH-2 connector (Terminated in 600 ohms.) Adjust the advanced channel so that the both phases are aligned.  ⬇ Align the phase of CH-1 with that of CH-2. 	CH-1: ⊘RV106/AU-75P(C-2) CH-2: ⊘RV206/AU-75P(A-2)
Step 2 - Play back the recorded tape in Step 1. - Display the lissajous's waveform.	AUDIO OUT CH-1 connector (Terminated in 600 ohms.) AUDIO OUT CH-2 connector (Terminated in 600 ohms.)  A ≦ 0.5 cm (Within ± 5°) Repeat Steps 1 and 2 until Step 2 is satisfied.	

11-27. OXIDE TAPE REC/PB LEVEL ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
Step 1 • Set the setup menu ITEM 901 to 1. • Supply a 1kHz signal(+4dBs) to the AUDIO IN CH-1/CH-2 connector. • Insert the BCT-20G and put the unit into the self-REC/PB mode.	CH-1: TP103/AU-75P(H-1), E102/AU-75P(D-1) CH-2: TP203/AU-75P(G-1), E202/AU-75P(B-1) −10 dBs Memorize the difference level from the specified value.	
Step 2 • Put the unit into the REC mode. • CONFI sw: ON	CH-1: TP103/AU-75P(H-1), E102/AU-75P(D-1) CH-2: TP203/AU-75P(G-1), E202/AU-75P(B-1) Correct the value memorized in Step 1. When the level is higher than the specified value in Step 1, lower the level proportionally. When it is lower than the specified value, raise the level proportionally.	CH-1: ⊘RV101/AU-75P(H-1) CH-2: ⊘RV201/AU-75P(F-1)
Step 3 • Put the unit into the self-REC/PB mode. • After adjustment is completed, set the setup menu ITEM 901 to 0.	CH-1: TP103/AU-75P(H-1), E102/AU-75P(D-1) CH-2: TP203/AU-75P(G-1), E202/AU-75P(B-1) −10 ± 0.2 dBs If the specification is not satisfied, repeat Step 1.	

11-28. METAL TAPE REC/PB LEVEL ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
Step 1 • Set the setup menu *ITEM 901 to 1. • Supply a 1kHz signal(+4ds) to the AUDIO IN CH-1/CH-2 connector. • Insert the BCT-20M and put the unit into the self-REC/PB mode.	CH-1: TP103/AU-75P(H-1), E102/AU-75P(D-1) CH-2: TP203/AU-75P(G-1), E202/AU-75P(B-1) −10 dBs Memorize the difference level from the specified value.	
Step 2 • Put the unit into the REC mode. • CONFI sw: ON	CH-1: TP103/AU-75P(H-1), E102/AU-75P(D-1) CH-2: TP203/AU-75P(G-1), E202/AU-75P(B-1) Correct the value memorized in Step 1. When the level is higher than the specified value in Step 1, lower the level proportionally. When it is lower than the specified value, raise the level proportionally.	CH-1: ⊘RV104/AU-75P(E-1) CH-2: ⊘RV204/AU-75P(C-1)
Step 3 • Put the unit into the self-REC/PB mode. • After adjustment is completed, set the setup *ITEM 901 to 0.	CH-1: TP103/AU-75P(H-1), E102/AU-75P(D-1) CH-2: TP203/AU-75P(G-1), E202/AU-75P(B-1) −10 ± 0.2 dBs If the specification is not satisfied, repeat Step 1.	

11-29. CONFI HEAD FREQUENCY RESPONSE ADJUSTMENT (DOLBY OFF)

11-29-1. Oxide Confi Head Frequency Response Adjustment (DOLBY OFF)

<table>
<tr><th>machine conditions for adjustment</th><th>specifications</th><th>adjustments</th></tr>
<tr>
<td>• Set S301 on the AU-76P board to ON.
• Connect an oscillator to the AUDIO IN CH-1/CH-2 connector.
• Insert the BCT-20G and put the unit into the REC mode.
• Set the oscillator frequency level to 40Hz, 1kHz, 7kHz, 10kHz and 15kHz at -16dBs and record each frequency for approx. 10 seconds.
• Play back the recorded tape.

• After adjustment is completed, check using the BCT-20G. Set S301 on the AU-76P board to OFF.</td>
<td>AUDIO OUT CH-1 connector (Terminated in 600 ohms.)
AUDIO OUT CH-2 connector (Terminated in 600 ohms.)
<table>
<tr><th>Freq.</th><th>Level (Metal tape)</th><th>Level (Oxide tape)</th></tr>
<tr><td>40Hz</td><td>0 ± 2.7dB</td><td>0 ±2.7dB</td></tr>
<tr><td>1kHz</td><td>0 (Ref.)</td><td>0 (Ref.)</td></tr>
<tr><td>7kHz</td><td>0 ± 1 dB</td><td>0 ± 1 dB</td></tr>
<tr><td>10kHz</td><td>0 ± 1 dB</td><td>0 ± 1 dB</td></tr>
<tr><td>15kHz</td><td>0 ± 1 dB</td><td>0 ± 1 dB</td></tr>
</table>
</td>
<td>• 3kHz. 7kHz portion
CH-1:
⊘RV102/AU-76P(E-8)
CH-2:
⊘RV202/AU-76P(F-8)

• 10kHz. 15kHz portion
CH-1:
⊘RV101/AU-76P(D-7)
CH-2:
⊘RV201/AU-76P(F-7)
METAL TAPE ONLY
CH-1:
⊘RV113/AU-76P(E-8)
CH-2:
⊘RV213/AU-76P(E-8)

• High-frequency fine tuning
CH-1:
S101/AU-76P(D-8)
CH-2:
S201/AU-76P(F-8)</td>
</tr>
</table>

11-29-2. Metal Confi Head Frequency Response Adjustment (DOLBY OFF)

<table>
<tr><th>machine conditions for adjustment</th><th>specifications</th><th>adjustments</th></tr>
<tr>
<td>• DOLBY NR sw: OFF
• Set S301 on the AU-76P to OFF.
• Connect an oscillator to the AUDIO IN CH-1/CH-2 connector.
• Insert the BCT-20M and put the unit into the REC mode.
• Set the oscillator frequency to 1kHz, 10kHz and 15kHz, and record each frequency for approx. 10 seconds.
• Play back the recorded tape.</td>
<td>AUDIO OUT CH-1 connector (Terminated in 600 ohms.)
AUDIO OUT CH-2 connector (Terminated in 600 ohms.)
<table>
<tr><th>Freq.</th><th>Level</th></tr>
<tr><td>1kHz</td><td>Ref.</td></tr>
<tr><td>10kHz</td><td>Ref. ± 1 dB</td></tr>
<tr><td>15kHz</td><td>Ref. ± 1 dB</td></tr>
</table>
</td>
<td>CH-1:
⊘RV113/AU-76P(E-8)
CH-2:
⊘RV213/AU-76P(E-8)</td>
</tr>
</table>

11-30. CONFI LEVEL ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Set the setup menu ITEM 901 to 1. • Set S301 on the AU-76P board to ON. • Supply a 1kHz signal(+4dBs) to the AUDIO IN CH-1/CH-2 connector. • Insert the BCT-20M and put the unit into the REC mode. • Play back the recorded tape. • After adjustment is completed, set S301 on the AU-76P board to OFF and set the setup menu *ITEM 901 to 1.	Step 1 CH-1: TP102/AU-76P(D-6), E101/AU-76P(D-7) CH-2: TP202/AU-76P(F-6), E201/AU-76P(F-7) −10 ± 0.2 dBs (for checking) −10 ± 0.1 dBs (for adjustment)	CH-1: ⊘RV103/AU-76P(D-7) CH-2: ⊘RV203/AU-76P(F-7)
	Step 2 CH-1: TP103/AU-76P(D-1), E102/AU-76P(D-1) CH-2: TP203/AU-76P(D-1), E202/AU-76P(C-1) −10 ± 0.2 dBs (for checking) −10 ± 0.1 dBs (for adjustment)	CH-1: ⊘RV104/AU-76P(C-7) CH-2: ⊘RV204/AU-76P(B-7)

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11-31. AUDIO INSERT MODE CROSSTALK ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Set RV404, RV405, RV504, and RV505 to the 4:00 position.		
Step 1 METAL CH-1 insert crosstalk (CH-2 insert crosstalk) • Connect the 1kHz and 9kHz signals (+4dBs) to AUDIO IN CH-1/CH-2 connector. • Insert the BCT-20M and put the set into the CH-1 AUDIO INSERT mode. • Set the CH-2 INSERT button to OFF. [• Insert the BCT-20M and put the set into the CH-2 AUDIO INSERT mode. • Set the CH-1 INSERT button to OFF.]	AUDIO OUT CH-2 connector (Terminated in 600 ohms.) AUDIO OUT CH-1 connector (Terminated in 600 ohms.) Minimize the level.	• 1kHz ⊘RV503/AU-75P(B-5) (⊘RV403/AU-75P(D-4)) • 9kHz ⊘RV504/AU-75P(C-5) (⊘RV404/AU-75P(C-4))
i) • Oscillator's frequency: 16kHz	AUDIO OUT CH-2 connector (Terminated in 600 ohms.) AUDIO OUT CH-1 connector (Terminated in 600 ohms.) −40dBs or less	⊘RV505/AU-75P(A-6) ⊘LV501/AU-75P(A-10) [⊘RV405/AU-75P(C-6) ⊘LV401/AU-75P(B-10)]
ii) • Oscillator's frequency: 10kHz/12.5kHz	AUDIO OUT CH-2 connector (Terminated in 600 ohms.) AUDIO OUT CH-1 connector (Terminated in 600 ohms.) 10kHz = −40dBs or less 12.5kHz = −26dBs or less	⊘RV503/AU-75P(B-5) ⊘RV504/AU-75P(C-5) [⊘RV403/AU-75P(D-4) ⊘RV404/AU-75P(C-4)]
Step 2 OXIDE • Oscillator's frequency: 17kHz • Using a short clip, short between TP402 on the TC-40P board and GND.	i) +1dBs or less = OK ii) +1dBs to +5dBs Set 0dBs at RV505/AU-75P and LV501/AU-75P (RV405/AU-75P, LV401/AU-75P) and readjust from Step 2 ii) and later. iii) +5dBs and higher Set −1dBs at RV505/AU-75P and LV501/AU-75P (RV405/AU-75P and LV401/AU-75P) and readjust from Step 1 ii) and later.	
• Check (METAL tape)	7kHz, −18dBs or less 10kHz, −18dBs or less 12.5kHz, −21dBs or less	

11-32. OVERALL CROSSTALK ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Supply a balanced 1kHz signal (+10dBs) to the AUDIO IN CH-1 connector. • Supply no signal to the AUDIO IN CH-2 connector. • AUDIO CH-2 INPUT LEVEL sw: HIGH • 600Ω sw: ON • CONFI sw: ON • Insert the BCT-20M and put the unit into the REC mode. • After adjustment is completed, set the AUDIO CH-2 INPUT LEVEL switch to LOW, 600-ohm switch to OFF, and CONFI switch to OFF.	Connect a spectrum analyzer to the AUDIO OUT CH-2 connector. Minimize the 1kHz level. (The 1kHz PB level difference between the AUDIO OUT CH-1 and CH-2 should be -65dB or less.)	⊘RV210/AU-75P(B-8) ⊘RV211/AU-75P(A-8) Note: Adjusted in REC mode. Measured in REC/PB mode.
• Supply a balanced 1kHz signal (+10dBs) to the AUDIO IN CH-2 connector. • Supply no signal to the AUDIO IN CH-1 connector. • AUDIO CH-1 INPUT LEVEL sw: HIGH • 600Ω sw: ON • CONFI sw: ON • Insert the BCT-20M and put the unit into the REC mode. • After adjustment is completed, set the AUDIO CH-1 INPUT LEVEL switch to LOW, 600-ohm switch to OFF, and CONFI switch to OFF.	Connect a spectrum analyzer to the AUDIO OUT CH-1 connector. Minimize the 1kHz level. (The 1kHz PB level difference between the AUDIO OUT CH-2 and CH-1 should be -65dB or less.)	⊘RV110/AU-75P(B-8) Note: Adjusted in REC mode. Measured in REC/PB mode.

11-33. TIME CODE OVERALL CROSSTALK ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Supply no signal to the AUDIO IN CH-1/CH-2 connector. • S2/SY-64P board (LTC sw): EXT • Supply a 1.2kHz signal to the TIME CODE IN connector. • Insert the BCT-20M and put the unit into the REC mode. • After adjustment is completed, set S2 on the SY-64P board to the former position.	Connect a spectrum analyzer to the AUDIO OUT CH-1/CH-2 connector. Minimize the 1.2kHz level. The 1.2kHz level should be -61dBs or less.	CH-1: ⊘RV108/AU-75P(C-8) CH-2: ⊘RV208/AU-75P(B-8)

11-34. TIME CODE INSERT CROSSTALK ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Insert the BCT-20G on which only a CTL signal is recorded. • Supply no signal to the AUDIO IN CH-1/CH-2 connector. • AUDIO CH-1, CH-2 INPUT LEVEL sw: HIGH • 600Ω sw: ON • MODE: TC INSERT • After adjustment is completed, set the INPUT LEVEL switch to LOW and the 600-ohm switch to OFF.	AUDIO OUT CH-1 connector (Terminated in 600 ohms.) AUDIO OUT CH-2 connector (Terminated in 600 ohms.) Minimize the level. (−16 dBm or less)	CH-1: ⊘RV401/AU-75P(B-10) CH-2: ⊘RV501/AU-75P(A-10) CH-1: ⊘RV402/AU-75P(C-9) CH-2: ⊘RV502/AU-75P(B-9) Repeat the above adjustment.

※ In Section 11-35 AFM Input Level Adjustment through Section 11-46 AFM PB Level Adjustment, set the switches as follows:

- Level control panel
  AUDIO MONITOR switch :AFM
- Subcontrol panel
  AFM INPUT switch :CH-3/-4

【Connection】

Fig. 1

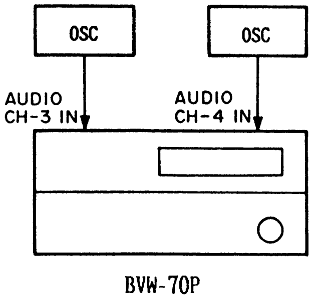

OSC
OSC
AUDIO CH-3 IN
AUDIO CH-4 IN
BVW-70P

Fig. 2

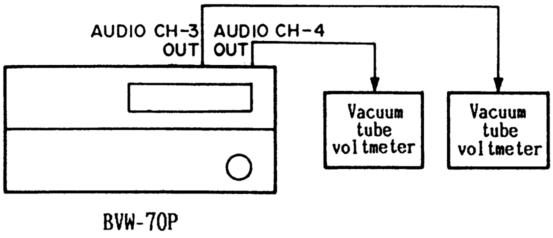

AUDIO CH-3 OUT
AUDIO CH-4 OUT
Vacuum tube voltmeter
Vacuum tube voltmeter
BVW-70P

Fig. 3

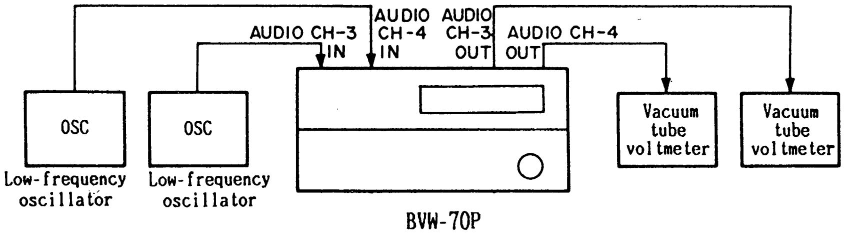

AUDIO CH-3 IN
AUDIO CH-4 IN
AUDIO CH-3 OUT
AUDIO CH-4 OUT
OSC
Low-frequency oscillator
OSC
Low-frequency oscillator
Vacuum tube voltmeter
Vacuum tube voltmeter
BVW-70P

Fig. 4

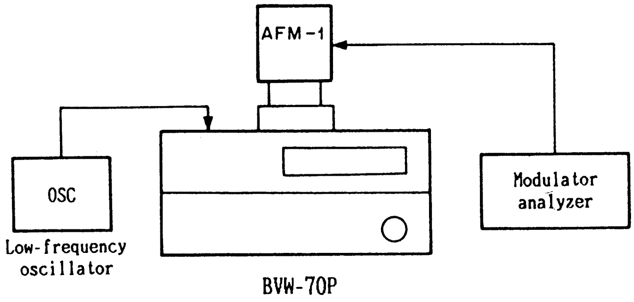

AFM-1
OSC
Low-frequency oscillator
Modulator analyzer
BVW-70P

Fig. 5

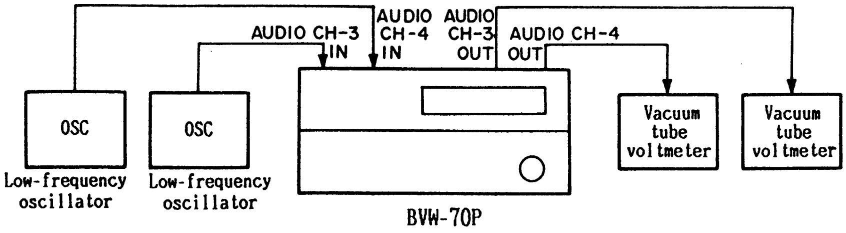
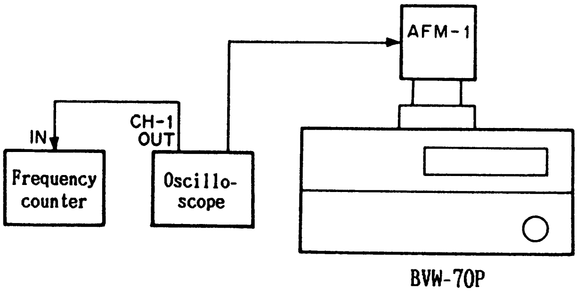

AUDIO CH-3 IN
AUDIO CH-4 IN
AUDIO CH-3 OUT
AUDIO CH-4 OUT
OSC
Low-frequency oscillator
OSC
Low-frequency oscillator
Vacuum tube voltmeter
Vacuum tube voltmeter
BVW-70P

Fig. 6


AFM-1
IN
CH-1 OUT
Frequency counter
Oscillo-scope
BVW-70P

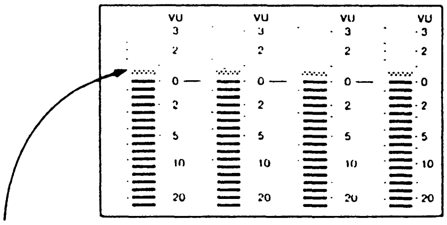
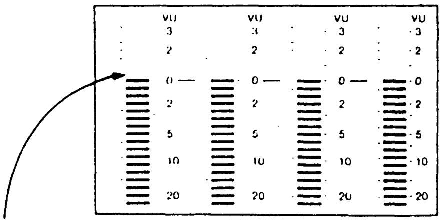
11−35. AFM INPUT LEVEL ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Supply a 400Hz signal(+4dBs) to the AUDIO IN CH-3/CH-4 connector. • MODE: EE • CONNECTION: Fig. 1	TP301/AFM-1(B-5) TP401/AFM-1(E-4) -10 ± 0.1 dBs	CH-3: ⊘RV301/BF-28(A-3) (Panel display: CH-3 REC VR) CH-4: ⊘RV401/BF-28(A-2) (Panel display: CH-4 REC VR)

11−36. AFM AUDIO OUT LEVEL ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Supply a 400Hz signal(+4dBs) to the AUDIO IN CH-3/CH-4 connector. • MODE: EE • CONNECTION: Fig. 3	AUDIO OUT CH-3 connector (Terminated in 600 ohms.) AUDIO OUT CH-4 connector (Terminated in 600 ohms.) 4 ± 0.1 dBm	CH-3: ⊘RV301/CP-161A(C-1) ⊘RV351/CP-111(D-2) CH-4: ⊘RV401/CP-161A(D-1) ⊘RV451/CP-111(D-1)

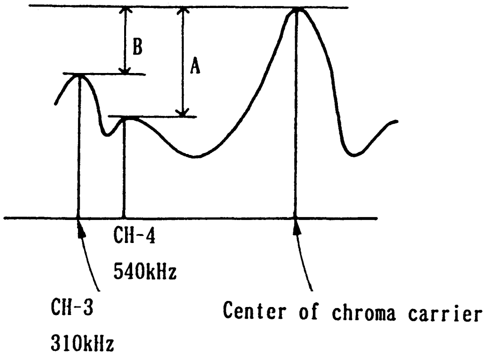
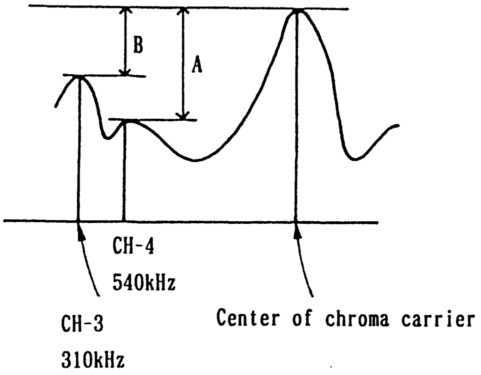
11−37. LEVEL METER 0VU ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Supply a 1kHz signal(+4.2dBs) to the AUDIO IN CH-1/CH-2 connector. • S1/DP-73(SCALE VU/dB select SW): VU (Located on the upper left.) • MODE: EE • AFM INPUT sw: CH-1/2	 The segment which is upper by one step than the display indicator's 0VU should blink.	CH-1: ⊘RV501/BF-28(I-3) CH-2: ⊘RV601/BF-28(I-2) CH-3: ⊘RV701/BF-28(I-2) CH-4: ⊘RV801/BF-28(I-1)
• Set the input level to 4dBs. • After adjustment is completed, set S1 on the DP-73 board to the former position.	 Up to the display indicator's 0VU lights, and the segment which is upper by one step should go off.	CH-1: ⊘RV501/BF-28(I-3) CH-2: ⊘RV601/BF-28(I-2) CH-3: ⊘RV701/BF-28(I-2) CH-4: ⊘RV801/BF-28(I-1)

11-38. LOG AMP LEVEL ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• S1/DP-73(SCALE VU/dB select SW): dB • AFM INPUT sw: CH-1/2 Step 1 • Supply a 1kHz signal(+13±0.1dBs) to the AUDIO IN CH-1/CH-2 connector.	Adjust so that the display indicator which is lower by one step than 0dB lights.	⊘RV902/BF-28(H-5) (HIGH LEVEL)
Step 2 • Supply a 1kHz signal(-17±0.1dBs) to the AUDIO IN CH-1/CH-2 connector.	Adjust so that the -30dB display indicator lights.	⊘RV903/BF-28(H-4) (MIDDLE LEVEL)
Step 3 • Supply a 1kHz signal(-27±0.1dBs) to the AUDIO IN CH-1/CH-2 connector.	Adjust so that the -40dB display indicator lights.	⊘RV901/BF-28(H-5) (LOW LEVEL)
Step 4 • Supply a 1kHz signal(+13±1dBs) to the AUDIO IN CH-1/CH-2 connector.	Check that the 0dB display indicator lights. Repeat the above Steps until the specification is satisfied.	

11-39. AFM RECORDING CURRENT ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
Step 1 • Supply no signal to the AUDIO IN CH-3/CH-4 connector. • Supply a black burst signal to the VIDEO IN connector. • INPUT SELECT sw: COMPOSITE • Insert the BCT-20M. • S1/AFM-1: OFF(right side) • Remove short socket SP101 on the RP-29P(C) board and short between TP103 and TP104 using a shoring clip. • Connect a current probe to the shorting clip and the output to the spectrum analyzer. • MODE: REC	TP103-TP104/RP-29P(C)(C-3)  B A CH-4 540kHz CH-3 310kHz Center of chroma carrier A = -26 ± 0.2 dB B = -23 ± 0.2 dB	Set RV603 near the center position. CH-4: ⊘RV602/AFM-1(C-3) (When no adjustment can be made, adjust using RV603.)
Step 2 • After Step 1 is adjusted, insert SP101 on the RP-29P(C) board, remove SP102, and short between TP105 and TP106 using a shorting clip. • Connect a current probe to the shorting clip and the output to the spectrum analyzer. • MODE: REC	TP105-TP106/RP-29P(C)(C-2)  B A CH-4 540kHz CH-3 310kHz Center of chroma carrier A = $-26 \pm {}^{2}_{3}$ dB B = -23 ± 1 dB	CH-3: ⊘RV114/RP-29P(C)(D-2)

11-40. AFM MODULATION ADJUSTMENT

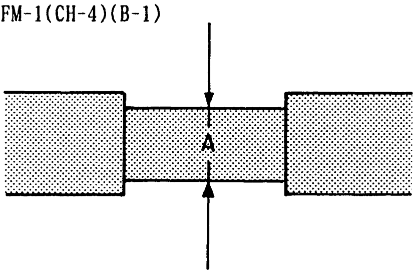
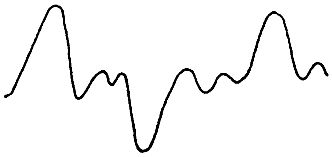
machine conditions for adjustment	specifications	adjustments
Step 1 (Reference modulation) • Insert alignment tape CR5-1B PS and play back an AFM 400Hz (25kHz deviation) signal. • Supply a 400Hz signal (+4dBm) to the AUDIO IN CH-3/CH-4 connector. • Insert the BCT-20M, put the set into the REC mode, and play back the recorded portion on tape.	AUDIO OUT CH-3 connector (Terminated in 600 ohms.) AUDIO OUT CH-4 connector (Terminated in 600 ohms.) Align the alignment tape level with the level in the PB mode.	CH-3: ⊘RV501/AFM-1(C-3) CH-4: ⊘RV502/AFM-1(D-3)
Step 2 (Maximum modulation) • Insert alignment tape CR5-1B PS and play back an AFM 400Hz (75kHz deviation) signal. • Supply a 400Hz signal (+24dBm) to the AUDIO IN CH-3/CH-4 connector. • Insert the BCT-20M, put the set into the REC mode, and play back the recorded portion on tape.	AUDIO OUT CH-3 connector (Terminated in 600 ohms.) AUDIO OUT CH-4 connector (Terminated in 600 ohms.) Align the alignment tape level with the level in the PB mode.	CH-3: ⊘RV104/AFM-1(E-3) CH-4: ⊘RV204/AFM-1(A-4)

11-41. AFM CARRIER FREQUENCY ADJUSTMENT

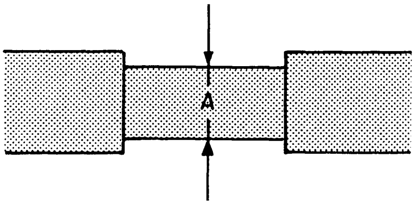
machine conditions for adjustment	specifications	adjustments
• Supply no signal to the AUDIO IN CH-3/CH-4 connector. • Insert the BCT-20M and put the unit into the REC mode. • CONNECTION: Fig. 6	TP101/AFM-1(E-2) TP103/AFM-1(D-1) 310 ± 1 kHz	CH-3: ⊘RV101/AFM-1(E-2) ⊘RV103/AFM-1(D-3)
	TP201/AFM-1(B-2) TP203/AFM-1(B-3) 540 ± 1 kHz	CH-4: ⊘RV201/AFM-1(A-2) ⊘RV203/AFM-1(A-3)

11-42. AFM RF LEVEL ADJUSTMENT

※ Section 11-40 AFM Carrier Frequency Adjustment should be completed.

machine conditions for adjustment	specifications	adjustments
• Play back an AFM 400Hz signal (25kHz deviation) on alignment tape CR5-1B PS.	TP3/AFM-1(CH-3)(D-1) TP4/AFM-1(CH-4)(B-1)  Set the lower level in channel A or B to satisfy the specificatiion. A = 1.5 ± 0.05 Vp-p  The waveform should not be clipped.	CH-3: ⊘RV2/AFM-1(D-2) CH-4: ⊘RV4/AFM-1(B-2) TRIG: TP701/AFM-1(B-6)

11-43. AFM DOC LEVEL ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Play back an AFM 400Hz signal (25kHz deviation) on alignment tape CR5-1B PS.	TP5/AFM-1(CH-3)(D-1) TP6/AFM-1(CH-4)(B-2)  Set the lower level in channel A or B to satisfy the specification. A = 0.3 ± 0.02 Vp-p	CH-3: ⊘RV5/AFM-1(D-1) CH-4: ⊘RV6/AFM-1(B-2) TRIG: TP701/AFM-1(B-6)

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11-44. SWITCHING NOISE ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Supply a 400Hz signal(+4dBs) to the AUDIO IN CH-3/CH-4 connector. • Insert the BCT-20M, record it for approx. one minute, and play back the recorded portion on tape.	AUDIO OUT CH-3 connector (Terminated in 600 ohms.) AUDIO OUT CH-4 connector (Terminated in 600 ohms.) Minimize the distortion factor. (0.5% or less)	CH-3: ⊘RV105/AFM-1(B-4) CH-4: ⊘RV205/AFM-1(B-4)

11-45. AFM PB SNR OUTPUT LEVEL ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Play back an AFM 400Hz signal (25kHz deviation) on alignment tape CR5-1B PS.	TP303/AFM-1(CH-3)(B-6) TP403/AFM-1(CH-4)(E-5) -10 ± 0.1 dBs	CH-3: ⊘RV102/AFM-1(B-3) CH-4: ⊘RV202/AFM-1(C-3)

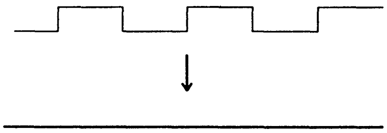
11-46. AFM PB LEVEL ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Play back an AFM 400Hz signal (25kHz deviation) on alignment tape CR5-1B PS. • CONNECTION: Fig. 2	AUDIO OUT CH-3 connector (Terminated in 600 ohms.) AUDIO OUT CH-4 connector (Terminated in 600 ohms.) 4 ± 0.1 dBm	CH-3: ⊘RV302/BF-28(A-2) (Panel display: CH-3 PB VR) CH-4: ⊘RV402/BF-28(A-1) (Panel display: CH-4 PB VR)

11-47. LTC AMP OUT ADJUSTMENT

【Switch Setting】

S2/SY-64P (EXT/INT sw) ································ INT
S3/SY-64P (REGEN/PRESET) ···························· PRESET
CTL/TC/U-BIT SW (on control panel) ········ CTL

machine conditions for adjustment	specifications	adjustments
• Insert the BCT-20M blank and put the unit into the REC mode.	CH-1: CN205, 11B/TC-40P } ADD mode CH-2: CN205, 11C/TC-40P  Minimize the level difference.	⊘RV202/TC-40P(D-4)

SECTION 12
VIDEO SYSTEM ALIGNMENT

Note: Before perform Sec. 12 VIDEO SYSYEM ALIGNMENT, perform Sec. 13-14 through 13-23.

【Equipment Required】

- Dual-trace oscilloscope
- Spectrum analyzer
- Network analyzer
- PAL signal generator: Tektronix 1411 or the equivalent
- PAL component signal generator: Tektronix TSG-300 or the equivalent
- Sweep generator: SIBASOKU VS12AX or the equivalent
- Waveform/vector monitor: Tektronix 1751 or the equivalent
- Vectorscope: Tektronix 521A or the equivalent
- Waveform monitor: Tektronix 1480 series or the equivalent
- Multi connector cable: J-6030-820-A
- Alignment tape CR5-2A PS, CR5-1B PS

CR5-2A PS (8-960-098-44) Contents

TIME min, sec	VIDEO TRACK
0:00	75% Color Bars
3:00	Multi Burst Y: 0.5, 1, 2, 3, 4.1, 4.5 MHz C: 0.2, 0.5, 1, 1.5, 2 MHz
6:00	Bowtie & 10T
9:00	Pulse & Bar C: No signal
11:00	Quad Phase
13:00	COMPOSITE Monoscope Video Phase, Diehedral
15:00	

CR5-1B PS (8-960-096-91) Contents

TIME min, sec	VIDEO TRACK	AFM
0:00	RF Sweep Marker 1, 2, 4, 6, 8, 10, 12 MHz	No-Signal
2:00	60% H. Sweep (CTDM) Marker 0.5, 1, 2, 3, 4, 5 MHz	
5:00	Pulse & Bar (CTDM)	
8:00	Multi Burst Y:0.5, 1, 2, 4, 5, 5.5 MHz C:0.2, 0.5, 1, 1.5, 2 MHz	
11:00	Pulse & Bar	
14:00	100% Color Bars	400Hz Sine Wave 25kHz Deviation
16:30		75kHz Deviation
17:00	50% Bowtie & 10T	No-Signal
19:00	Line 17A Signal	
22:00	Quad Phase	
24:00	Flat Field	
26:00	100% Color Bars with dropout	
28:00	Composite H. Sweep with VISC	
30:00		

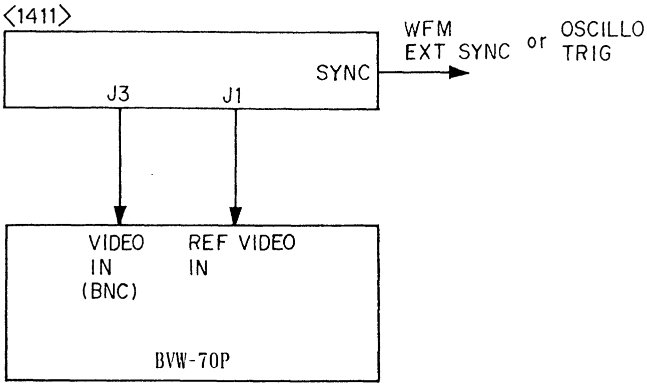
【Switch Setting】

- Function Control Panel
  - CONFI switch : OFF
  - PB.PB/EE switch : PB/EE
  - CTL/TC/U-BIT switch : CTL
- Control Panel
  - AUDIO MONITOR switch : ST/MIX
  - AUDIO MONITOR switch : LNG
  - AUDIO LIMITER switch : OFF
  - AUDIO MIXING switch : OFF
  - TRACKING control switch : FIXED
  - REMOTE/LOCAL switch : LOCAL
  - INPUT SELECT switch : COMPOSITE
- Subcontrol Panel
  - TBC CONTROL switch : LOCAL
  - VIDEO switch : PRESET
  - CHROMA switch : PRESET
  - BLACK LEVEL switch : PRESET
  - Y/C DELAY switch : PRESET
  - TBC BYPASS switch : ON
  - VIDEO INPUT switch : AUTO
  - REC INHIBIT switch : OFF
  - CAPSTAN LOCK switch : 2FD
  - AFM INPUT switch : CH-1/2
  - AUDIO MONITOR switch : ST
  - DOLBY NR switch : OFF
- Connector Panel
  - REF VIDEO selector : AUTO
  - REF VIDEO 75 ohm termination : ON
  - VIDEO IN 75 ohm termination : ON
  - COMPONENT Select switch : COMPONENT 2
- DEC-46P Board
  - S1 (CHROMA SUBTRACT) : ON
- DEC-42P Board
  - S500 (VITC BLANKING) : SEL
- MD-46P Board
  - S1 (MD REFERENCE) : OFF
  - S2 (REFERENCE POSITION) : 19H
- DM-56P Board
  - S402 (Y NON-LINEAR PREEMPHASIS BYPASS) : OFF
  - S403 (Y OXIDE NOISE CANCEL) : OFF
  - S802 (C NON-LENEAR PREEMPHASIS BYPASS) : OFF
  - S901 (COMPOSITE DT) : OFF
  - SP101 (Y RF AGC OFF) : OPEN
  - SP102 (Y RF AGC ON) : SHORT
  - SP301 (Y SIGNAL ON/OFF) : SHORT
  - SP402 (Y VIDEO OUT ON/OFF) : SHORT
  - SP501 (C RF AGC OFF) : OPEN
  - SP502 (C RF AGC ON) : SHORT
  - SP701 (C SIGNAL ON/OFF) : SHORT
  - SP801 (C VIDEO OUT ON/OFF) : SHORT
- TBC-7D, 7E Board
  - S101 (VISC) : ON
  - S200 (TEST) : ON
- TBC-12P Board
  - S500-1 (DIGITAL COMB FILTER) :OFF
  - S500-2 (LINE ADDER) :OFF
  - S500-3 (UNDER FIND) :OFF
  - S500-4 (VISC MUTE) :OFF

- TBC-9P Board
  - S3-1 to 8 (BLANKING POSITION) : ON
  - S4-1 to 7 (BLANKING POSITION) : ON
  - S4-8 (TBC SYNC DELAY) : OFF
- EN-48P Board
  - S1 (B & W MODE) : OFF
  - S2 (ID BLANKING) : OFF
- VO-18P Board
  - S1 (CHARACTER BACK) : B BACK
  - S2 (Y MUTE) : OFF
  - S3 (NON-COMPOSITE) : OFF
  - S4 (VISC) : ON
  - S5 (VISC) : ON
- SY-61 Board
  - S1 (CHARACTER) : ON
  - S201 (SYNCHRONIZE) : ON
  - S202 (VTR CONTROL) : INT
- SY-64P Board
  - S1 (VITC/AUTO/LTC) : LTC
  - S2 (EXT/INT) : INT
  - S3 (REGEN/PRESET) : PRESET
  - S4 (REC RUN/FREE RUN) : FREE RUN
  - S6 (VITC) : ON
  - S7 (ID PRESET) : OFF

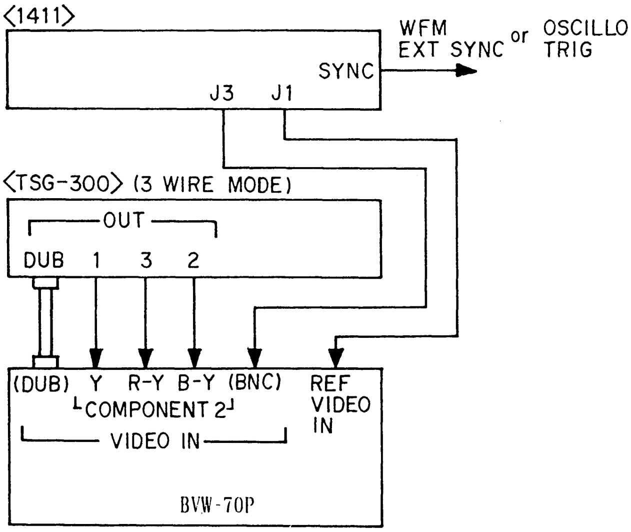
【 Ordinary Connections 】

Fig 1 : 12-1-1 through 12-1-19



<1411>
SYNC
J3
J1
WFM EXT SYNC or OSCILLO TRIG
VIDEO IN (BNC)
REF VIDEO IN
BVW-70P

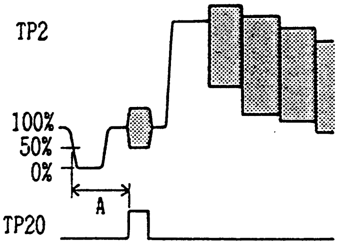
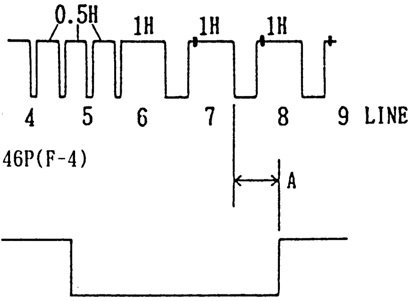
Fig 2 : 12-1-20 through 12-2-12



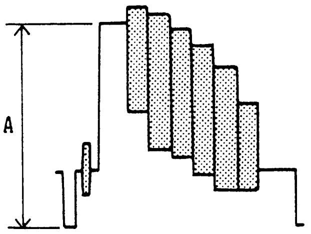
<1411>
SYNC
J3
J1
WFM EXT SYNC or OSCILLO TRIG
<TSG-300> (3 WIRE MODE)
OUT
DUB
1
3
2
(DUB)
Y
R-Y
B-Y
(BNC)
COMPONENT 2
VIDEO IN
REF VIDEO IN
BVW-70P

12-1. DEC BOARD ADJUSTMENT

12-1-1. AGC Burst Gate Pulse Timing Adjustment

machine conditions for adjustment	specifications	adjustments
• Supply a 100% color-bars signal to the VIDEO IN connector. • INPUT SELECT sw: COMPOSITE • MODE: EE	TP2/DEC-46P(B-4) TP20/DEC-46P(F-3)  A = 6.6 ± 0.2 μsec	⊘RV7/DEC-46P(E-4) TRIG: 1411 SYNC HD
	TP2/DEC-46P(B-4)  0.5H 1H 1H 1H 4 5 6 7 8 9 LINE A TP5/DEC-46P(F-4) A = 35 ± 5 μsec	⊘RV8/DEC-46P(G-5) TRIG: 1411 SYNC (FLD REF)

12-1-2. AGC Level Adjustment

machine conditions for adjustment	specifications	adjustments
• Supply a 100% color-bars signal to the VIDEO IN connector. • INPUT SELECT sw: COMPOSITE • MODE: EE	TP2/DEC-46P(B-4)  Measured in the A level. A = 0.45 ± 0.01 Vp-p	⊘RV6/DEC-46P(F-6) TRIG: 1411 SYNC HD

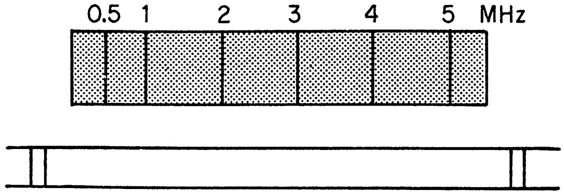
12-1-3. VIDEO Frequency Responese Adjustment

<table>
<tr><th>machine conditions for adjustment</th><th>specifications</th><th>adjustments</th></tr>
<tr><td>

- Supply a V sweep (REDUSED) signal to the VIDEO IN connector.
- INPUT SELECT sw: COMPOSITE
- MODE: EE
- VIDEO control/subcontrol panel: MANUAL, fully turn it clockwise.
- After adjustment is completed, set the VIDEO control to PRESET position.

</td><td>

TP19/DEC-46P(C-1)



<table>
<tr><th>Freq.</th><th>Level</th></tr>
<tr><td>0.5 MHz</td><td>100%(Ref.)</td></tr>
<tr><td>1.0 MHz</td><td>$100 \pm {}^{2}_{3}\%$</td></tr>
<tr><td>2.0 MHz</td><td>$100 \pm {}^{2}_{3}\%$</td></tr>
<tr><td>3.0 MHz</td><td>$100 \pm {}^{2}_{3}\%$</td></tr>
<tr><td>4.0 MHz</td><td>$100 \pm {}^{2}_{3}\%$</td></tr>
<tr><td>5.0 MHz</td><td>$100 \pm {}^{2}_{3}\%$</td></tr>
</table>

</td><td>

⊘CV1/DEC-46P(A-3)

TRIG: 1411 SYNC (FLD REF)

</td></tr>
</table>

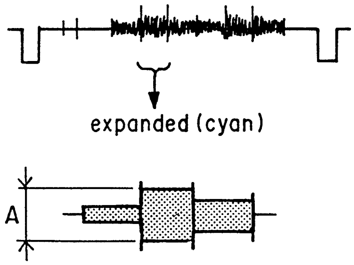
12-1-4. Y NON STD TRAP Adjustment

<table>
<tr><th>machine conditions for adjustment</th><th>specifications</th><th>adjustments</th></tr>
<tr><td>

- Supply a 100% color-bars signal to the VIDEO IN connector.
- Set the signal generator's Y switch to OFF.
- INPUT SELECT sw: COMPOSITE
- MODE: EE
- VIDEO INPUT sw/subcontrol panel: NON STD
- S1/DEC-46P(C-2): OFF
- After adjustment is completed, set the VIDEO INPUT switch, S1 on the DEC-46P board and signal generator's Y switch to former position.

</td><td>

TP17/DEC-46P(G-2)



Measured in the A level
(Cyan's noise amount)
A ≦ 100 mVp-p(minimize)

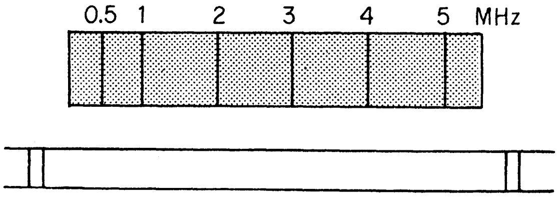
</td><td>

⊘LV1/DEC-46P(G-2)

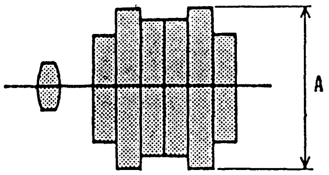
TRIG: 1411 SYNC HD

</td></tr>
</table>

12-1-5. Y Output Frequency Response Tentative Adjustment

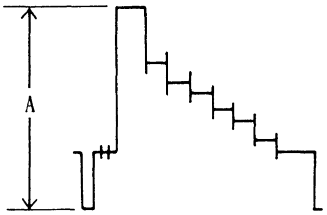
<table>
<tr><th>machine conditions for adjustment</th><th>specifications</th><th>adjustments</th></tr>
<tr>
<td>• Supply a V sweep (REDUSED) signal to the VIDEO IN connector.
• INPUT SELECT sw: COMPOSITE
• MODE: EE
• S1/DEC-46P(C-2): OFF
• After adjustment is completed, set S1 on the DEC-46P board to ON.</td>
<td>TP17/DEC-46P(G-2)

<table>
<tr><th>Freq.</th><th>Level</th></tr>
<tr><td>0.5MHz</td><td>100%(Ref.)</td></tr>
<tr><td>1 MHz</td><td>100 ± 2%</td></tr>
<tr><td>2 MHz</td><td>100 ± 2%</td></tr>
<tr><td>3 MHz</td><td>100 ± 2%</td></tr>
<tr><td>4 MHz</td><td>100 ± 5%</td></tr>
<tr><td>5 MHz</td><td>100 ± 5%</td></tr>
</table>
</td>
<td>⊘CV101/DEC-46P(E-1)
TRIG: 1411 SYNC (FLD REF)</td>
</tr>
</table>

12-1-6. Chroma Correlator Input Level Adjustment

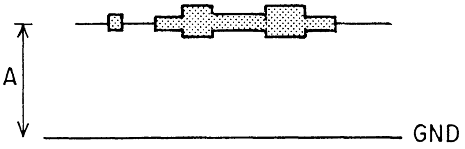
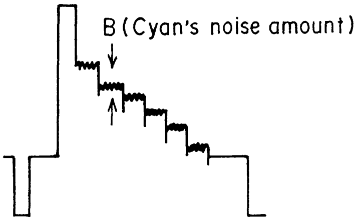
<table>
<tr><th>machine conditions for adjustment</th><th>specifications</th><th>adjustments</th></tr>
<tr>
<td>• Supply a 100% color-bars signal to the VIDEO IN connector.
• INPUT SELECT sw: COMPOSITE
• MODE: EE</td>
<td>TP11/DEC-46P(B-3)
TP15/DEC-46P(B-3)
TP18/DEC-46P(B-2)


A = 1.0 ± 0.05 Vp-p</td>
<td>⊘RV2/DEC-46P(B-3)
⊘RV5/DEC-46P(B-2)
⊘RV4/DEC-46P(B-2)
TRIG: 1411 SYNC HD</td>
</tr>
</table>

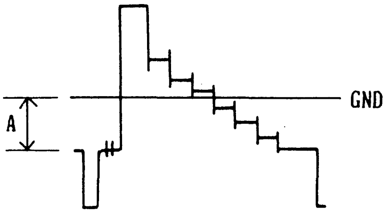
12-1-7. Y Output Level Adjustment

machine conditions for adjustment	specifications	adjustments
• Supply a 100% color-bars signal to the VIDEO IN connector. • INPUT SELECT sw: COMPOSITE • MODE: EE	TP17/DEC-46P(G-2)  A = 1.0 ± 0.02 Vp-p	⊘RV13/DEC-46P(F-1) TRIG: 1411 SYNC HD

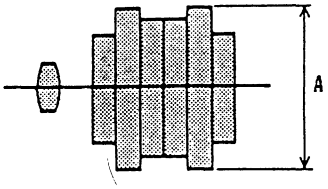
12-1-8. Y/C Cancel Adjustment

machine conditions for adjustment	specifications	adjustments
• Supply a 100% color-bars signal to the VIDEO IN connector. • INPUT SELECT sw: COMPOSITE • MODE: EE	Step 1 TP13/DEC-46P(D-2)  A = 3.0 $\pm ^{0.2}_{0.6}$ Vdc	⊘RV14/DEC-46P(D-3)
	Step 2 TP402/DEC-42P(H-3)  B = minimum ≦ 20 mVp-p If the specification is not satisfied, change the TP13 waveform within specification A using RV14 on the DEC-46P board, then retry.	⊘RV11/DEC-46P(D-3) ⊘RV15/DEC-46P(A-2)
	Step 3 Check that the TP13 waveform satisfies specification A. If the specification is not satisfied, adjust RV14 on the DEC-46P board, then repeat form Step 2.	TRIG: 1411 SYNC HD

12-1-9. Y DC Offset Voltage Adjustment

machine conditions for adjustment	specifications	adjustments
• Supply a 100% color-bars signal to the VIDEO IN connector. • INPUT SELECT sw: COMPOSITE • MODE: EE	TP17/DEC-46P(G-2)  A = 230 ± 5 mVdc	⊘RV1/DEC-46P(F-6) TRIG: 1411 SYNC HD

12-1-10. Chroma Output Level Adjustment

machine conditions for adjustment	specifications	adjustments
• Supply a 100% color-bars signal to the VIDEO IN connector. • INPUT SELECT sw: COMPOSITE • MODE: EE	TP14/DEC-46P(H-3)  A = 1.05 ± 0.02 Vp-p	⊘RV12/DEC-46P(H-3) TRIG: 1411 SYNC HD

http://getMANUAL.com

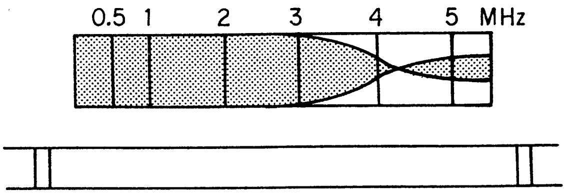
12-1-11. Y OUTPUT Frequency Response Adjustment

<table>
<tr><th>machine conditions for adjustment</th><th>specifications</th><th>adjustments</th></tr>
<tr>
<td>

- Supply a V sweep (REDUSED) signal to the VIDEO IN connector.
- INPUT SELECT sw: COMPOSITE
- MODE: EE
- S1/DEC-46P(C-2): OFF
(Spec. A)
- S1/DEC-46P(C-2): ON
(Spec. B)

</td>
<td>

TP17/DEC-46P(G-2)



<table>
<tr><td></td><td colspan="2">Level</td></tr>
<tr><td>Freq.</td><td>Spec. A</td><td>Spec. B</td></tr>
<tr><td>0.5MHz</td><td>100%(Ref.)</td><td>100%(Ref.)</td></tr>
<tr><td>1.0MHz</td><td>100 ± 2%</td><td>100 ± 2%</td></tr>
<tr><td>2.0MHz</td><td>100 ± 2%</td><td>98 ± 2%</td></tr>
<tr><td>3.0MHz</td><td>100 ± 5%</td><td>$75 \pm {}^{7}_{5}\%$</td></tr>
<tr><td>4.0MHz</td><td>100 ± 5%</td><td>———</td></tr>
<tr><td>5.0MHz</td><td>100 ± 5%</td><td>———</td></tr>
</table>

</td>
<td>

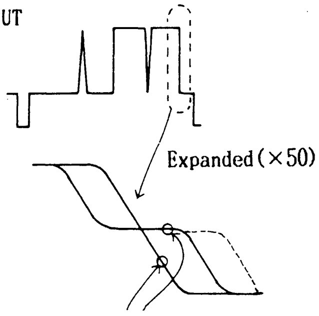
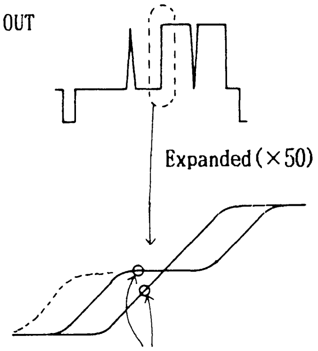
- For Spec. A
⊘CV101/DEC-46P(E-1)

TRIG: 1411 SYNC HD

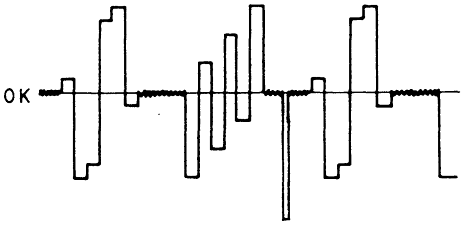
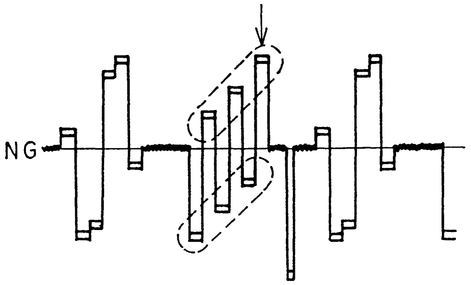
</td>
</tr>
</table>

12－1－12. Noise Reduction Pulse Adjustment

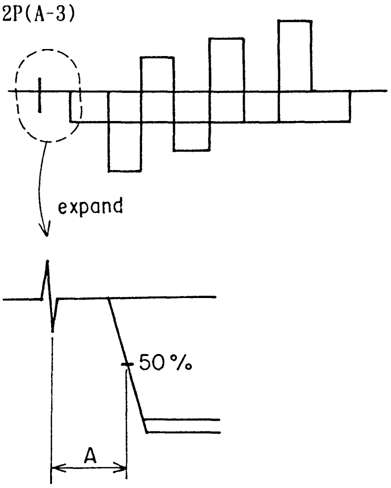
- Before performing this adjustment, perform Sec. 13 TBC Alignment.

machine conditions for adjustment	specifications	adjustments
• INPUT SELECT sw: Y-R, B • Supply a pulse & bar signal (-1.5dB) the COMPONENT 2 IN connector.	Step 1 COMPONENT 2 Y OUT  The luminance in two lines should be the same.	⊘RV202/DEC-46P(B-6) Short between TP702 the NR-32 board and GND.
	Step 2 COMPONENT 2 Y OUT  The luminance in two lines should be the same.	⊘RV201/DEC-46P(B-5) Short between TP702 the NR-32 board and GND.

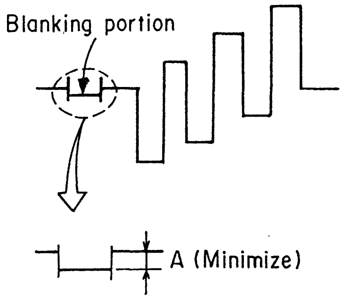
12-1-13. Decode Axis Phase Adjustment

machine conditions for adjustment	specifications	adjustments
• Supply a 100% color-bars signal to the VIDEO IN connector. • INPUT SELECT sw: COMPOSITE • MODE: EE	TP403/DEC-42P(H-2)   Minimize the level fluctuation.	⊘RV7/DEC-42P(C-4) TRIG: TP500/DEC-42P(F-4)

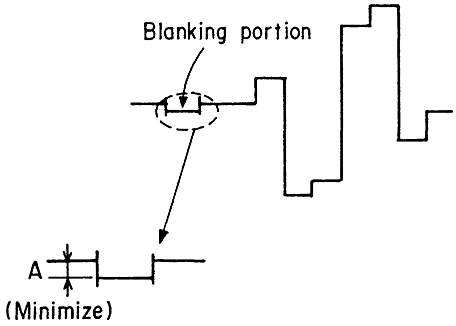
12-1-14. C Blanking Width Adjustment

machine conditions for adjustment	specifications	adjustments
• Supply a half red color-bars signal to the VIDEO IN connector. • INPUT SELECT sw: COMPOSITE • MODE: EE	TP3/DEC-42P(A-3)  A = 1.5 ± 0.05 μsec	⊘RV512/DEC-42P(G-5) TRIG: 1411 SYNC HD

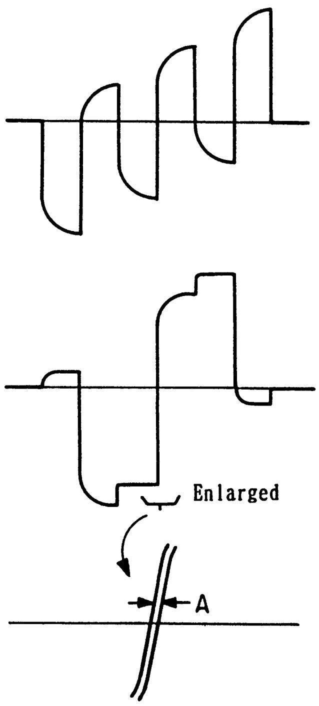
12-1-15. B-Y H Blanking DC Level Adjustment

machine conditions for adjustment	specifications	adjustments
• Supply a 100% color-bars signal to the VIDEO IN connector. • INPUT SELECT sw: COMPOSITE • MODE: EE	TP3/DEC-42P(A-3)  Blanking portion A (Minimize) A = 0 ± 2 mV	⊘RV3/DEC-42P(A-4) TRIG: 1411 SYNC HD

12-1-16. R-Y H Blanking DC Level Adjustment

machine conditions for adjustment	specifications	adjustments
• Supply a 100% color-bars signal to the VIDEO IN connector. • INPUT SELECT sw: COMPOSITE • MODE: EE	TP4/DEC-42P(B-3)  Blanking portion A (Minimize) A = 0 ± 2 mV	⊘RV6/DEC-42P(B-4) TRIG: 1411 SYNC HD

12-1-17. Decoded R-Y/B-Y Timing Error Adjustment

machine conditions for adjustment	specifications	adjustments
• Supply a 100% REVERSE Y OFF color-bars signal to the VIDEO IN connector. • INPUT SELECT sw: COMPOSITE • MODE: EE	TP3/DEC-42P(A-3) TP4/DEC-42P(B-3)  A = 0 ± 10 nsec	⊘RV8/DEC-42P(B-4) TRIG: 1411 SYNC HD

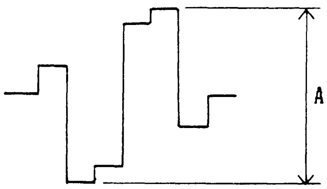
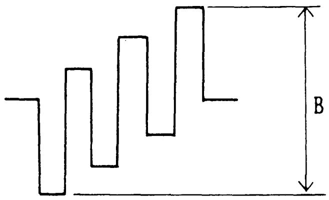
12-1-18. CTDM Clock AFC Adjustment

machine conditions for adjustment	specifications	adjustments
• Supply a 100% color-bars signal to the COMPONENT 2 IN connector. • INPUT SELECT sw: Y-R, B • MODE: EE • Using a digital voltmeter.	TP802/DEC-42P(C-5) Measure the DC voltage A volt TP803/DEC-42P(D-4) Measure the DC voltage B volt (Higher voltage) - (lower voltage) ≦ 50 mVdc ((A - B or B - A) ≦ 50 mVdc)	⊘LV801/DEC-42P(D-3)

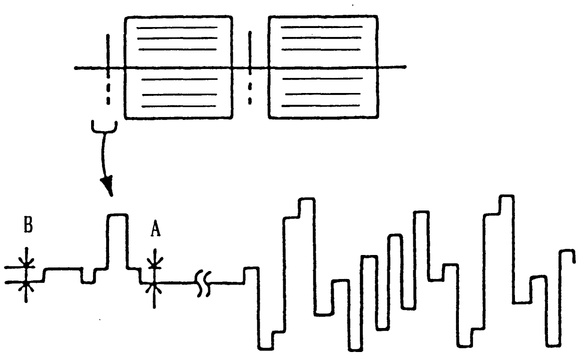
12-1-19. CTDM A/D REC DC Adjustment

machine conditions for adjustment	specifications	adjustments
• Supply a 100% color-bars signal to the COMPONENT 2 IN connector. • INPUT SELECT sw: Y-R, B • MODE: EE • Using a digital voltmeter	TP205/DEC-42P(D-2) 3.000 ± 0.005 Vdc	⊘RV205/DEC-42P(C-2)

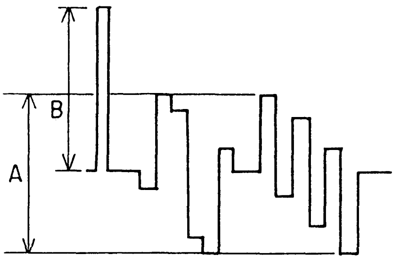
12-1-20. CTDM A/D Input Level Adjustment

machine conditions for adjustment	specifications	adjustments
• Supply a 100% color-bars signal to the COMPONENT 2 IN connector. • INPUT SELECT sw: Y-R, B • MODE: EE	TP201/DEC-42P(D-2)  A = 1.80 ± 0.01 Vp-p	⊘RV203/DEC-42P(D-2)
	TP202/DEC-42P(D-1)  B = 1.80 ± 0.01 Vp-p	⊘RV204/DEC-42P(D-1) TRIG: 1411 SYNC HD

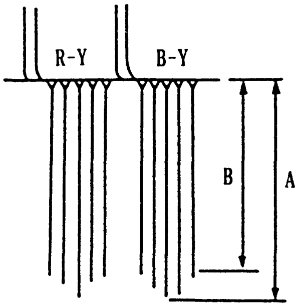
12-1-21. CTDM A/D Input DC Adjustment

machine conditions for adjustment	specifications	adjustments
• Supply a 100% color-bar signal to the COMPONENT 2 IN connector. • INPUT SELECT sw: Y-R, B • MODE: EE	TP203/DEC-42P(G-1) Step 1 B-Y DC Adjustment  A = 0 ± 5 mV	⊘RV206/DEC-42P(D-2)
	Step 2 R-Y DC Adjustment B = 0 ± 5 mVdc	⊘RV207/DEC-42P(D-2) TRIG: 1411 SYNC (FLD REF)

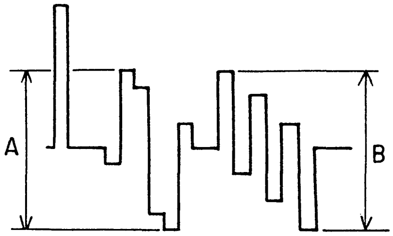
12-1-22. COMPONENT 2 Input Level Adjustment

machine conditions for adjustment	specifications	adjustments
• Supply a 100% color-bar signal to the COMPONENT 2 IN connector. • INPUT SELECT sw: Y-R, B • MODE: EE	TP19/MD-46P(C-5)  A = 0.93 ± 0.01 Vp-p B = 0.84 ± 0.01 Vp-p	• For A ⊘RV412/DEC-42P(H-1) • For B ⊘RV405/DEC-42P(H-2) TRIG: 1411 SYNC HD

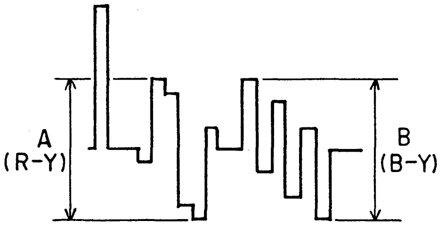
12-1-23. C Linearity Adjustment

machine conditions for adjustment	specifications	adjustments
• Supply a 5 STEP signal to the COMPONENT 2 IN connector. • INPUT SELECT sw: Y-R, B • MODE: EE • WAVEFORM MONITOR: DIFF'D MODE	TP19/MD-46P(C-5) (WFM)  A (Maximize level) = 100% B (Minimize level) ≧ 97%	• For R-Y ⊘RV208/DEC-42P(E-2) • For B-Y ⊘RV209/DEC-42P(E-2)

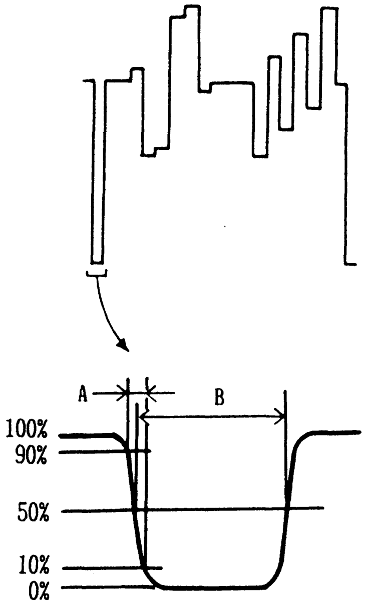
12-1-24. COMPONENT 1 Input Level Adjustment

machine conditions for adjustment	specifications	adjustments
• Supply a 100% color-bar signal to the DUB/COMPONENT 1 IN connector. • INPUT SELECT sw: Y-R, B • COMPONENT 1/2 connector select switch on the connector panel: DUB/COMPONENT 1 • MODE: EE • After adjustment is completed, set COMPONENT select switch to former position.	TP19/MD-46P(C-5)  A (R-Y) = 0.93 ± 0.01 Vp-p B (B-Y) = 0.93 ± 0.01 Vp-p	• For A ⊘RV201/DEC-42P(A-2) • For B ⊘RV202/DEC-42P(A-1) TRIG: 1411 SYNC HD

12-1-25. Composite Input Chroma Level Adjustment

machine conditions for adjustment	specifications	adjustments
• Supply a 100% color-bar signal to the VIDEO IN connector. • INPUT SELECT sw: COMPOSITE • MODE: EE	TP19/MD-46P(C-5)  A (R-Y) = 0.93 ± 0.01 Vp-p B (B-Y) = 0.93 ± 0.01 Vp-p	(B-Y) ⊘RV2/DEC-42P(A-5) (R-Y) ⊘RV5/DEC-42P(A-5) TRIG: 1411 SYNC HD

12-1-26. Chroma Reference Sync Adjustment

machine conditions for adjustment	specifications	adjustments
• Supply a 100% color-bar signal to the COMPONENT 2 IN connector. • INPUT SELECT sw: Y-R, B • MODE: EE	TP17/MD-46P(E-5)  A = 220 ± 20 nsec B = 2.00 ± 0.05 μsec	A: ⊘LV401/DEC-42P(J-2) B: ⊘RV505/DEC-42P(D-7) TRIG: 1411 SYNC HD

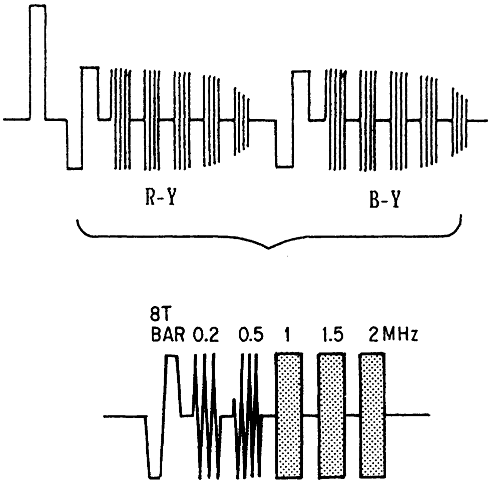
12-1-27. COMPONENT 2 Frequency Response Adjustment

<table>
<tr><th>machine conditions for adjustment</th><th>specifications</th><th>adjustments</th></tr>
<tr>
<td>

- Supply a 60% multi burst signal to the COMPONENT 2 IN connector.
- INPUT SELECT sw: Y-R, B
- MODE: EE

</td>
<td>

TP19/MD-46P(C-5)
(WFM)



<table>
<tr><th>Freq.</th><th>Spec.</th></tr>
<tr><td>8T bar</td><td>100%(Ref.)</td></tr>
<tr><td>0.2MHz</td><td>100 ± 3%</td></tr>
<tr><td>0.5MHz</td><td>100 ± 3%</td></tr>
<tr><td>1.0MHz</td><td>100 ± 3%</td></tr>
<tr><td>1.5MHz</td><td>100 ± 3%</td></tr>
<tr><td>2.0MHz</td><td>98 ± 5%</td></tr>
</table>

</td>
<td>

⊘CV403/DEC-42P(H-1)

TRIG: EXT 1411 SYNC HD

</td>
</tr>
</table>

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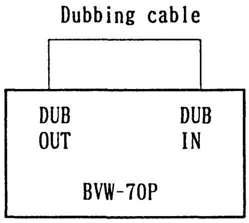
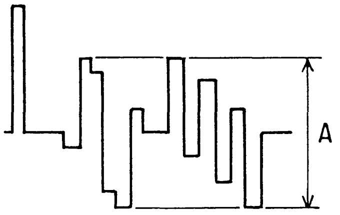
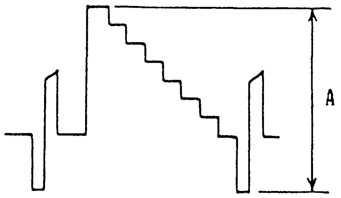
12-1-28. DUB CTDM Input Level Adjustment



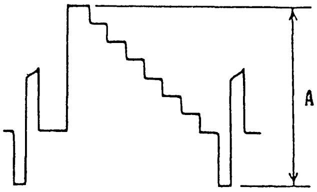
This Adjustment should be done after Sec. 12-5-21. C DUB OUT Level Adjustment.

machine conditions for adjustment	specifications	adjustments
• Connect the DUB OUT and DUB IN connectors with a dubbing cable. • Play back a 100% color-bar signal on alignment tape CR5-1B PS. • INPUT select sw: CTDM • After adjustment is completed, disconnect the dubbing cable.	TP19/MD-46P(C-5)  A = 0.93 ± 0.01 Vp-p	⊘RV406/DEC-42P(J-1) TRIG: 1411 SYNC HD

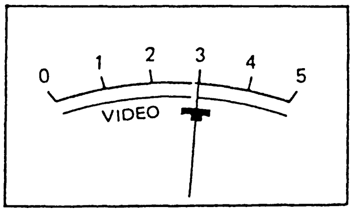
12-1-29. Component Output Y Level Adjustment

machine conditions for adjustment	specifications	adjustments
• Supply a 100% color-bar signal to the COMPONENT 2 IN connector. • INPUT SELECT sw: Y-R, B • MODE: EE	TP4/MD-46P(D-3)  A = 1.0 ± 0.01 Vp-p	⊘RV402/DEC-42P(H-4) TRIG: 1411 SYNC HD

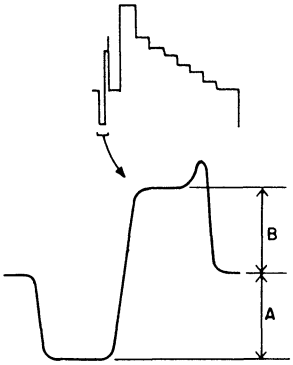
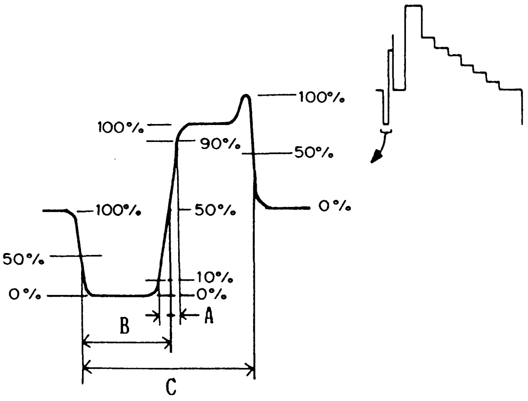
12-1-30. Composite Output Y Level Adjustment

machine conditions for adjustment	specifications	adjustments
• Supply a 100% color-bar signal to the VIDEO IN connector. • INPUT SELECT sw: COMPOSITE • MODE: EE	TP4/MD-46P(D-3)  A = 1.0 ± 0.01 Vp-p	⊘RV407/DEC-42P(H-6) TRIG: 1411 SYNC HD

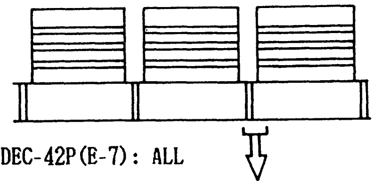
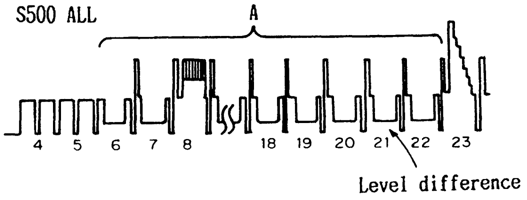
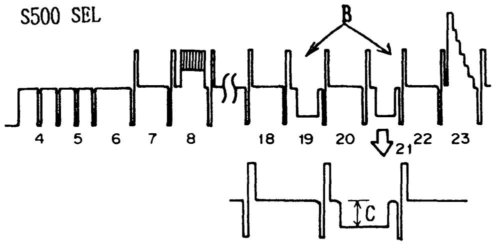
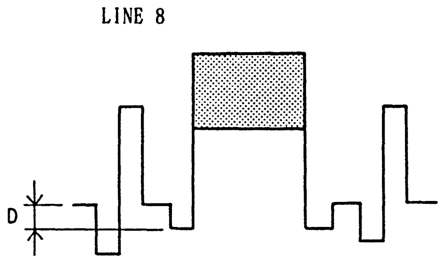
12-1-31. VIDEO Meter Adjustment

machine conditions for adjustment	specifications	adjustments
• Supply a 100% color-bar signal to the COMPONENT 2 IN connector. • INPUT SELECT sw: Y-R, B • MODE: EE	VIDEO METER  The pointer should be in the center of scale 3.	⊘RV403/DEC-42P(H-5)

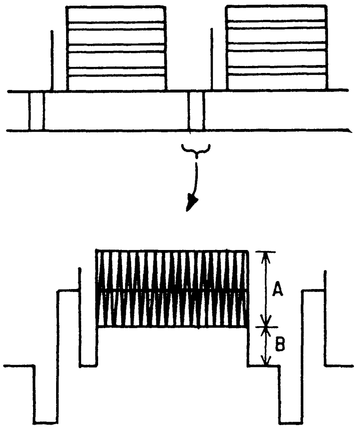
12-1-32. Y REF Sync Adjustment

machine conditions for adjustment	specifications	adjustments
• Supply a 100% color-bar signal to the COMPONENT 2 IN connector. • INPUT SELECT sw: Y-R, B • MODE: EE	Step 1 TP4/MD-46P(C-3)  A = 100% Ref. B = 125.0 ± 2.5%	⊘RV404/DEC-42P(H-3) TRIG: 1411 SYNC HD
	Step 2 TP4/MD-46P(C-3)  100% 100% 90% 50% 100% 50% 0% 50% 0% 10% 0% B A C A = 180 ± 20 nsec B = 2.65 ± 0.05 μsec C = 5.0 ± 0.1 μsec	A: ⊘LV400/DEC-42P(J-3) B: ⊘RV502/DEC-42P(E-5) C: ⊘RV503/DEC-42P(E-5) TRIG: 1411 SYNC HD

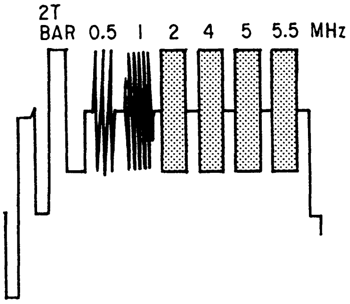
12-1-33. VITC Blanking and VISC Muting Adjustment

machine conditions for adjustment	specifications	adjustments
- Supply a 100% color-bar signal to the VIDEO IN connector. - INPUT SELECT sw: COMPOSITE - Set the VITC switch on the SY-64P board to ON. - MODE: EE - Turn S500/DEC-42P to ALL/SEL. - Fully turn RV408/DEC-42P counterclockwise once.	TP4/MD-46P(C-3)  S500/DEC-42P(E-7): ALL  S500 ALL A 4 5 6 7 8 18 19 20 21 22 23 Level difference Spec. 1 Level differences should be appear at portion A (6 to 22 lines). S500/DEC-42P(E-7): SEL  S500 SEL B 4 5 6 7 8 18 19 20 21 22 23 C Spec. 2 Level differences should appear at portion B (19 and 21 lines).	
	Spec. 3 Level differences C should be 0 ± 10 mV or less.	⊘RV408/DEC-42P(J-4)
	Spec. 4  Level differences D (line 8) should be 0 ± 10 mV or less.	⊘RV411/DEC-42P(J-4) TRIG: 1411 SYNC HD

12-1-34. VISC Adjustment

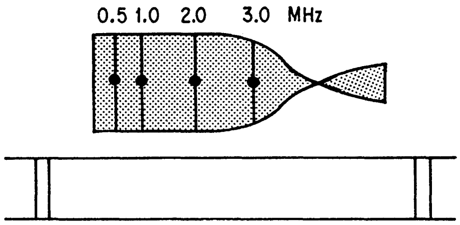
machine conditions for adjustment	specifications	adjustments
• Supply a 100% color-bar signal to the VIDEO IN connector. • INPUT SELECT sw: COMPOSITE • MODE: EE	TP4/MD-46P(C-3) Line 8  A = $300 \pm {}^{0}_{20}$ mVp-p B = 200 ± 10 mVp-p	• For A ⊘RV508/CF-36P on the DEC-42P(D-7). • For B ⊘RV509/CF-36P on the DEC-42P(D-7). TRIG: 1411 SYNC (FLD REF)

12-1-35. COMPONENT Y Frequency Response Adjustment

<table>
<tr><th>machine conditions for adjustment</th><th>specifications</th><th>adjustments</th></tr>
<tr>
<td>• Supply a 60% multi burst signal to the COMPONENT 2 IN connector.
• INPUT SELECT sw: Y-R, B
• MODE: EE</td>
<td>TP4/MD-46P(C-3)

<table>
<tr><th>Freq.</th><th>Level</th></tr>
<tr><td>2T bar</td><td>100%(Ref.)</td></tr>
<tr><td>0.5MHz</td><td>100 ± 2%</td></tr>
<tr><td>1.0MHz</td><td>100 ± 2%</td></tr>
<tr><td>2.0MHz</td><td>100 ± 2%</td></tr>
<tr><td>4.0MHz</td><td>100 ± 2%</td></tr>
<tr><td>5.0MHz</td><td>100 ± 2%</td></tr>
<tr><td>5.5MHz</td><td>100 ± 2%</td></tr>
</table>
</td>
<td>⊘CV402/DEC-42P(J-3)
TRIG: 1411 SYNC HD</td>
</tr>
</table>

12-1-36. COMPOSITE Y Frequency Response Adjustment

<table>
<tr><th>machine conditions for adjustment</th><th>specifications</th><th>adjustments</th></tr>
<tr>
<td>
- Supply a 60% V-sweep signal to the VIDEO IN connector.
- INPUT SELECT sw: COMPOSITE
- MODE: EE
</td>
<td>
TP4/MD-46P(C-3)

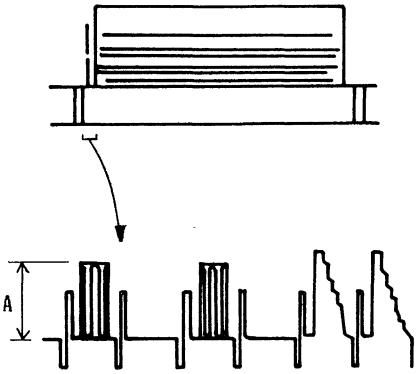


<table>
<tr><th>Freq.</th><th>Level</th></tr>
<tr><td>0. 5MHz</td><td>100%(Ref.)</td></tr>
<tr><td>1. 0MHz</td><td>100 ± 2%</td></tr>
<tr><td>2. 0MHz</td><td>100 ± $\substack{1\\5}$%</td></tr>
<tr><td>3. 0MHz</td><td>80 ± 5%</td></tr>
</table>
</td>
<td>
⊘CV401/DEC-42P(H-6)

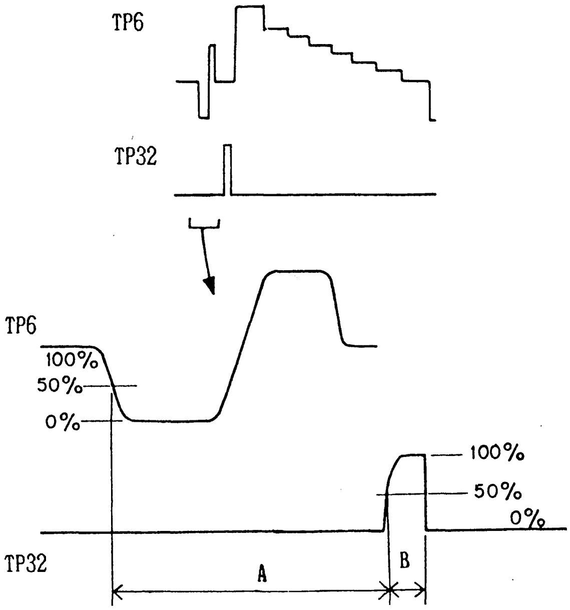
TRIG: 1411 SYNC (FLD REF)
</td>
</tr>
</table>

12-2. MD-46P BOARD ADJUSTMENT

12-2-1. VITC Mix Level Adjustment

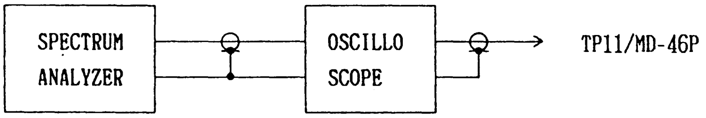
machine conditions for adjustment	specifications	adjustments
• INPUT SELECT sw: Y-R, B • Supply a 100% color-bars signal to the COMPONENT 2 IN connector. • MODE: EE	TP4/MD-46P(C-3)  A = 0.55 ± 0.02 Vp-p	⊘RV1/MD-46P(D-2) TRIG: 1411 SYNC HD

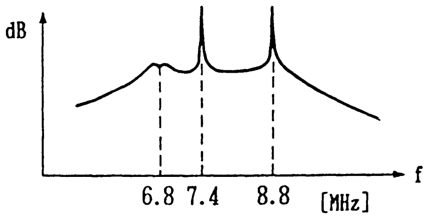
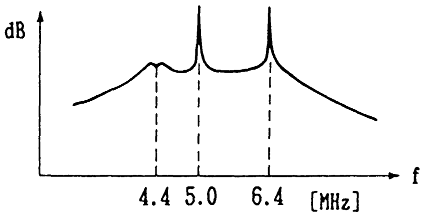
12-2-2. Y Clamp Pulse Adjustment

machine conditions for adjustment	specifications	adjustments
• INPUT SELECT sw: Y-R, B • Supply a 100% color-bars signal to the COMPONENT 2 IN connector. • MODE: EE	TP6/MD-46P(C-3) TP32/MD-46P(F-3)  TP6 TP32 TP6 100% 50% 0% 100% 50% 0% TP32 A B A (Timing) = 6.0 ± 0.1 μsec B (Width) = 2.0 ± 0.1 μsec	• Timing ⊘RV6/MD-46P(G-3) • Width ⊘RV7/MD-46P(F-3) TRIG: 1411 SYNC HD

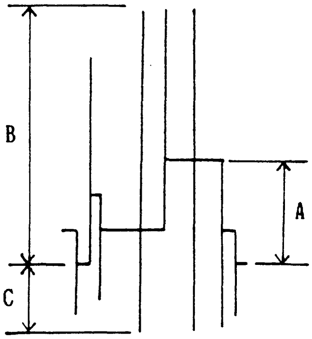
12-2-3. Y Deviation Adjustment

【Connection】

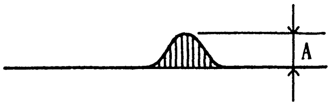
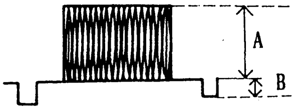
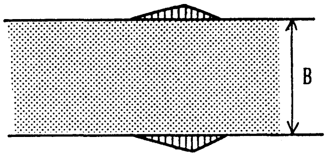
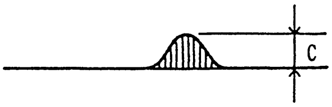


machine conditions for adjustment	specifications	adjustments
Step 1 (METAL) • INPUT SELECT sw: Y-R, B • Supply a 100% flat field signal to the COMPONENT 2 IN connector. • MODE: STANDBY	TP11/MD-46P(B-1)  • Pedestal carrier adjustment Set the peak level on the center to 7.400MHz. • Deviation adjustment Set the gap between two peak levels to 1.400MHz.	• Pedestal ⊘RV22/MD-46P(A-2) • Deviation ⊘RV3/MD-46P(A-3) (adjust alternately)
Step 2 (OXIDE) • Insert the BCT-20G cassette tape. • MODE: STANDBY	 • Sync tip carrier adjustment Set the peak level on the center to 5.000MHz. • Deviation adjustment Set the gap between two peak levels to 1.400MHz.	• Pedestal ⊘RV42/MD-46P(A-2) • Deviation ⊘RV54/MD-46P(C-3)

12-2-4. Y White/Dark Clip Adjustment

machine conditions for adjustment	specifications	adjustments
Step 1 (OXIDE) • INPUT SELECT sw: Y-R, B • Supply a pulse & bar signal to the COMPONENT 2 IN connector. • Insert the BCT-20G cassette tape. • MODE: EE	TP8/MD-46P(B-3)  A = 100 % Ref. B = 250 ± 5% (white clip) C = 65 ± 5% (dark clip)	• White clip ⊘RV4/MD-46P(C-2) • Dark clip ⊘RV5/MD-46P(D-2) TRIG: 1411 SYNC HD
Step 2 (METAL) • MODE: EE • Connect a mylar capacitor (0.001μF) between TP34/MD-46P(C-3) and TP35/MD-46P(C-3) board. • After adjustment is completed, remove the capacitor.	A = 100 % Ref. B = 300 ± 5% (white clip) C = 150 ± 5% (dark clip)	• White clip ⊘RV44/MD-46P(C-2) • Dark clip ⊘RV45/MD-46P(D-2) TRIG: 1411 SYNC HD

12-2-5. Y-REC HF Slice Level Adjustment

machine conditions for adjustment	specifications	adjustments
• INPUT SELECT sw: Y-R, B • Supply a H sweep signal to the COMPONENT 2 Y IN connector. • Using a VS12AX • MODE: EE	TP3/MD-46P(C-2)  A = 20 ± 2 mVp-p (Slice)	• Slice ⊘RV34/MD-46P(C-2)
• H SWEEP GEN.: H SWEEP (0.5~8.0MHz) TP4/MD-46P(C-3)  • Adjust the signal generator so that A is 1±0.01Vp-p and B is 0.3±0.01Vp-p.	TP10/MD-46P(A-1)  B = 500 ± 20 mVp-p (Level)	• Level ⊘RV38/MD-46P(C-2)
• Insert a BCT-20G cassette tape. • MODE: EE	TP3/MD-46P(C-2)  C = 50 ± 2 mVp-p (Slice)	• Slice ⊘RV33/MD-46P(C-2) TRIG: 1411 SYNC HD

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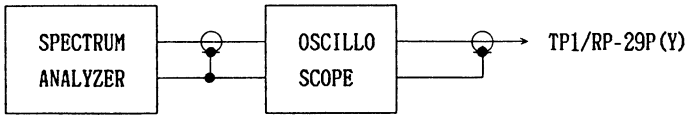
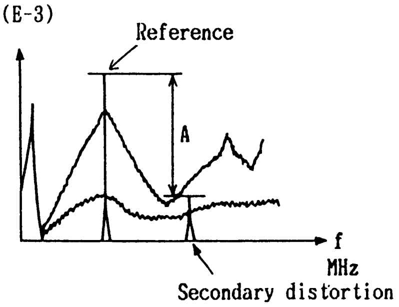
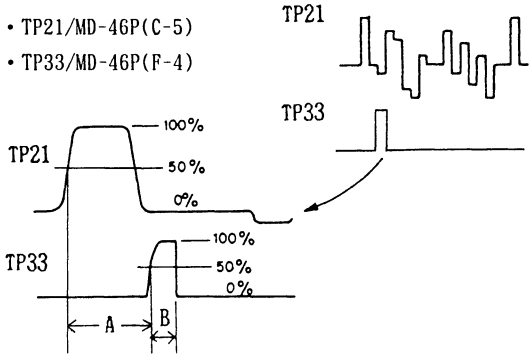
12-2-6. Y Modulator Balance Adjustment

【Connection】



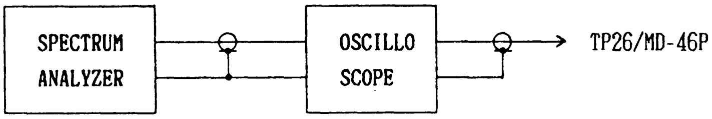
machine conditions for adjustment	specifications	adjustments
• INPUT SELECT sw: Y-R, B • Supply a 50/50/50 flat field signal to the COMPONENT 2 IN connector. • Insert the BCT-20M cassette tape. • MODE: EE	TP1/RP-29P(Y)(E-3)  Minimize the secondary distortion. A ≧ 40dB	⊘RV8/MD-46P(A-2)
• Insert the BCT-20G cassette tape. • MODE: EE	TP1/RP-29P(Y)(E-3) Minimize the secondary distortion. A ≧ 40dB	

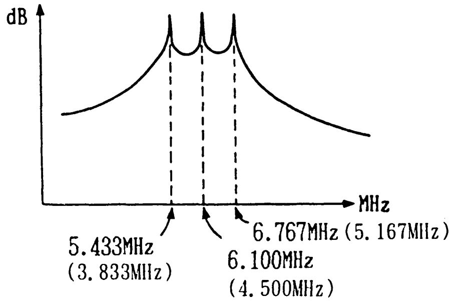
12-2-7. C Clamp Pulse Adjustment

machine conditions for adjustment	specifications	adjustments
• INPUT SELECT sw: Y-R, B • Supply a 100% color-bars signal to the COMPONENT 2 IN connector. • MODE: EE	• TP21/MD-46P(C-5) • TP33/MD-46P(F-4)  TP21 TP33 TP21 100% 50% 0% TP33 100% 50% 0% A B A = 2.40 ± 0.05 μsec (Timing) B = 0.6 ± 0.05 μsec (Width)	• Timing ⊘RV16/MD-46P(G-4) • Width ⊘RV17/MD-46P(F-4) TRIG: 1411 SYNC HD

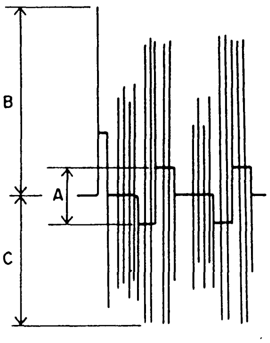
12-2-8. C Deviation Adjustment

【Connection】

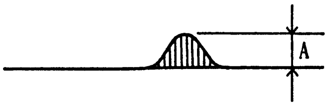
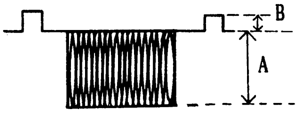
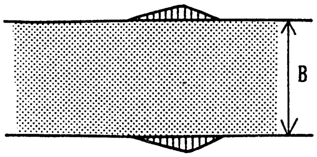
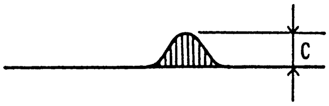


machine conditions for adjustment	specifications	adjustments
Step 1 • INPUT SELECT sw: Y-R, B • Supply a 100% color-bars signal to the COMPONENT 2 IN connector. • MODE: STANDBY	TP26/MD-46P(B-4)  Pedestal carrier adjustment: Set the center peak level to 6.100MHz. Deviation adjustment: Set the gap between two peaks (5.433MHz and 6.767MHz) to 1.334MHz.	• Pedestal ⊘RV23/MD-46P(A-5) • Deviation ⊘RV13/MD-46P(A-5)
Step 2 • Supply a 100% color-bars signal to the COMPONENT 2 IN connector. • Insert the BCT-20G cassette tape. • MODE: STANDBY	Pedestal carrier adjustment: Set the center peak level to 4.500MHz. Deviation adjustment: Set the gap between two peaks (3.833MHz and 5.167MHz) to 1.334MHz.	• Pedestal ⊘RV43/MD-46P(A-4) • Deviation ⊘RV501/MD-46P(C-5)

12-2-9. C White/Dark Clip Adjustment

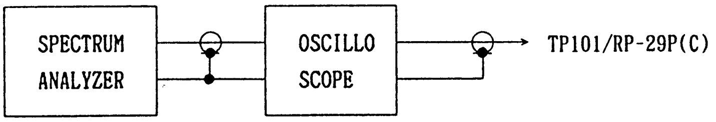
machine conditions for adjustment	specifications	adjustments
Step 1 (OXIDE) • INPUT SELECT sw: Y-R, B • Supply a pulse & bar signal to the COMPONENT 2 IN connector. • Insert the BCT-20G cassette tape. • MODE: EE • After adjustment is completed, eject the cassette tape.	TP23/MD-46P(B-5)  A = 100% Ref. B = 225 ± 5% (high clip) C = 130 ± 5% (low clip)	• High clip ⊘RV46/MD-46P(C-5) • Low clip ⊘RV15/MD-46P(D-5) TRIG: 1411 SYNC HD
Step 2 (METAL) • MODE: EE • Connect a mylar capacitor (0.001μF) between TP36/MD-46P(C-5) and TP37/MD-46P(C-5) board. • After adjustment is completed, remove the capacitor.	A = 100% Ref. B = 285 ± 5% (high clip) C = 195 ± 5% (low clip)	• High clip ⊘RV14/MD-46P(C-4) • Low clip ⊘RV47/MD-46P(D-4) TRIG: 1411 SYNC HD

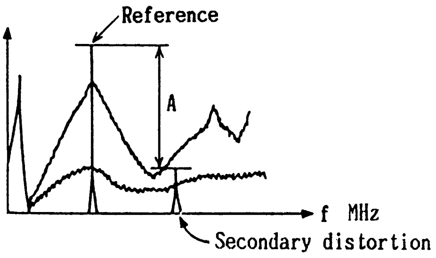
12-2-10. C-REC HF Slice Level Adjustment

machine conditions for adjustment	specifications	adjustments
• INPUT SELECT sw: CTDM • Supply a H sweep signal to the DUB/COMPONENT 1 C.CTDM IN connector. • Using a VS12AX • MODE: EE	TP18/MD-46P(C-5)  A = 10 ± 2 mVp-p (Slice)	• Slice ⊘RV35/MD-46P(C-4)
• H SWEEP GEN.: H SWEEP (0.5~8.0MHz) TP19/MD-46P(D-5)  • Adjust the signal generator so that A is 1.10±0.01 Vp-p and B is 0.3±0.01 Vp-p.	TP25/MD-46P(A-4)  B = 500 ± 20 mVp-p (Level)	• Level ⊘RV39/MD-46P(C-4)
• Insert a BCT-20G cassette tape. • MODE: EE	TP18/MD-46P(C-5)  C = 10 ± 2 mVp-p (Slice)	• Slice ⊘RV37/MD-46P(C-4) TRIG: 1411 SYNC HD

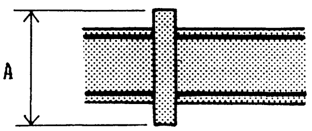
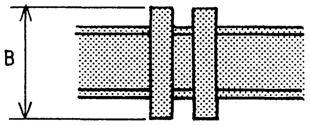
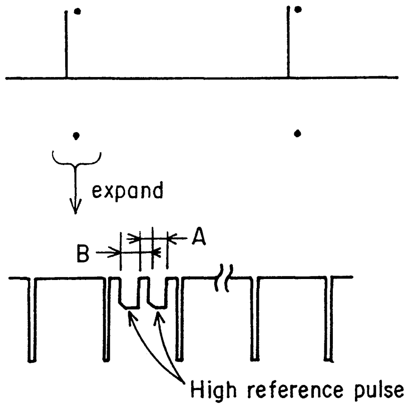
12-2-11. C Modulator Balance Adjustment

【Connection】


SPECTRUM ANALYZER
OSCILLO SCOPE
TP101/RP-29P(C)

machine conditions for adjustment	specifications	adjustments
• INPUT SELECT sw: Y-R, B • Supply a 50/50/50 flat field signal to the COMPONENT 2 IN connector. • Insert the BCT-20M cassette tape. • MODE: EE	TP101/RP-29P(C)(E-3)  Minimize the secondary distortion. A≧40dB	⊘RV18/MD-46P(A-5)
• Insert the BCT-20G cassette tape. • MODE: EE	TP101/RP-29P(C)(E-3) Minimize the secondary distortion. A≧40dB	

12-2-12. White Reference Adjustment

machine conditions for adjustment	specifications	adjustments
Step 1 • INPUT SELECT sw: Y-R, B • Supply a 50/50/50 flat field signal to the COMPONENT 2 IN connector. • Set S1 on MD-46P(A-3) board to ON. • MODE: EE • Using S2 on the MD-46P(G-2) board set the gate timing to 19H during V blanking period.	TP11/MD-46P(B-1)  A = 0.37 ± 0.03 Vp-p	⊘RV55/MD-46P(C-1) TRIG: 1411 SYNC VD
Step 2 • Same conditions in Step 1.	TP26/MD-46P(B-3)  B = 0.37 ± 0.03 Vp-p	⊘RV56/MD-46P(D-4) TRIG: 1411 SYNC VD
Step 3 • Chroma signal: Non signal (pedestal level) • Y signal: 50% flat field signal • After adjustment is completed, set S1 on the MD-46P(A-3) board to OFF.	TP401/TBC-7D, 7E(C-2)  A = 32 ± 1 μsec B = 32 ± 1 μsec	• Timing (A) ⊘RV57/MD-46P(F-2) • Timing (B) ⊘RV58/MD-46P(G-2) TRIG: 1411 SYNC VD

12-3. RP-29P (Y) BOARD ADJUSTMENT

The RP-29P (Y) board adjustments are as follows:

12-3-2 Y-Metal REC Current & Secondary Distortion Adjustment (RV1, RV3, RV5, and RV6)
↓
12-3-3 Y-Oxide REC Current & Secondary Distortion Adjustment (RV2 and RV4)
↓
12-3-4 Y-REC RF Frequency Response Adjustment (Steps 1 and 2) (RV7 and RV9)
↓
12-3-2 Y-Metal REC Current & Seccondary Distortion Adjustment (Check)
↓
12-3-4 Y-REC RF Frequency Response Adjustment (Step 3) (RV8 and RV10)
↓
12-3-3 Y-Oxide REC Current & secondary Distortion Adjustments (Check)
↓
12-3-5 Y-OA Frequency Response Check

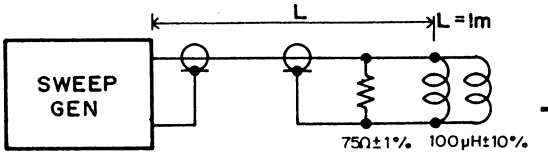
This adjustment cannot be performed without adjustment the DM-56P board.

Note: The "Y-PB RF Frequency Response Adjustment" in 12-3-1 is used to adjust the DM-56P board.

12-3-1. Y-PB RF Frequency Response Adjustment

- Head coupling tool

To make this adjustment, stop the head drum rotation without a cassette tape and L-couple the sweep signal with the video head using two inductors (approx. 100 μH × 2).



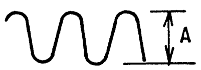
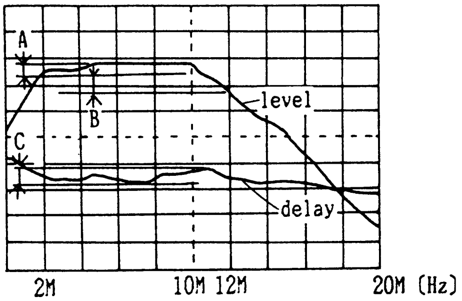
→ Put the inductors near the video head.

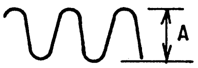
Sweep signal range: 1 to 20 MHz

- Network analyzer

MAG	0.5 dB
DLY	10 nsec
CF	10 MHz
SPAN	20 MHz
ST	4.0 sec
IRG	0 dB
RBW	10 kHz
VBW	10 kHz
DR	1 μsec

- This adjustment must be adjusted first of play back system.

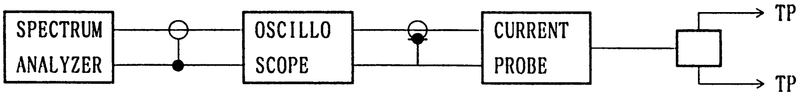
machine conditions for adjustment	specifications	adjustments
Step 1 • MODE: EE • Close the head coupling tool in the R/P Y A channel head. • Connect the network analyzer via an oscilloscope to CN110-7C on the DM-56P board. • Adjust OUTPUT LEVEL of the network analyzer. TP3/DM-56P(C-4)  A = 0.7 ± 0.1Vp-p (6MHz through 8MHz portion)	CN110-7C/DM-56P(B-7)  A ≦ 0.5 dB (Level difference between 2 MHz and 10 MHz) C ≦ 10 nsec (Delay difference between 3 MHz and 12 MHz) B ≦ 1dB (Level difference between 2 MHz and 12 MHz)	CH-A: ⊘RV11/RP-29P(Y)(B-3)

Step 2 • Close the head coupling tool in the R/P Y B channel head. • Connect the network analyzer via an oscilloscope to CN110-11C on the DM-56P board. • Adjust OUTPUT LEVEL of the network analyzer. TP3/DM-56P(C-4)  A = 0.7 ± 0.1Vp-p (6MHz through 8MHz portion)	CN110-11C/DM-56P(B-7) A ≦ 0.5 dB (Level difference between 2 MHz and 10 MHz) C ≦ 10 nsec (Delay difference between 3 MHz and 12 MHz) B ≦ 1 dB (Level difference between 2 MHz and 12 MHz)	CH-B: ⊘RV12/RP-29P(Y)(D-4)

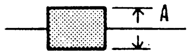
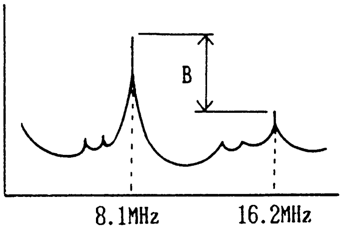
12-3-2. Y-Metal REC Current and Secondary Distortion Adjustments

- Before performing this adjustment, perform Sec. 12-6-1 through 12-6-11.

【Connection】

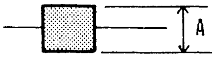


- Be sure that the B/W LIMIT switch of the oscilloscope is set to OFF.

machine conditions for adjustment	specifications	adjustments
• Remove SP1(C-3) and SP2(C-1) on the RP-29P(Y) board. • Using a shorting clip, short between TP3 and TP4, and TP5 and TP6. • INPUT SELECT sw: Y-R, B • Supply a 50% flat field signal to the COMPONENT 2 IN connector. • Insert the BCT-20M cassette tape. • MODE: REC • After adjustment is completed, remove the shorting clips and insert SP1(C-3) and SP2(C-1).	CH-A: TP3-TP4/RP-29P(Y)(C-3)(C-3) CH-B: TP5-TP6/RP-29P(Y)(C-2)(C-2) Using a current probe Waveform on oscilloscope  $A = 50 \pm^{0}_{10}$ mA Using a spectrum analyzer  Minimize 16.2 MHz. B ≧ 40dB	• Level adjustment CH-A: ⊘RV1/RP-29P(Y)(D-3) CH-B: ⊘RV3/RP-29P(Y)(D-1) • Secondary distortion adjustment CH-A: ⊘RV5/RP-29P(Y)(D-3) CH-B: ⊘RV6/RP-29P(Y)(D-1) TRIG: TP901/DM-56P(C-1)

12-3-3. Y-Oxide REC Current and Secondary Distortion Adjustments

- Before performing this adjustment, perform Sec. 12-6-1 through 12-6-11.

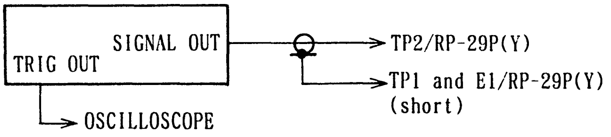
machine conditions for adjustment	specifications	adjustments
• Remove SP1(C-3) and SP2(C-1) on the RP-29P(Y) board. • Using a shorting clip, short between TP3 and TP4, and TP5 and TP6. • INPUT SELECT sw: Y-R, B • Supply a 50% flat field signal to the COMPONENT 2 IN connector. • Insert the BCT-20G cassette tape. • MODE: REC • After adjustment is completed, remove the shorting clips and insert SP1(C-3) and SP2(C-1).	CH-A: TP3-TP4/RP-29P(Y)(C-3)(C-3) CH-B: TP5-TP6/RP-29P(Y)(C-2)(C-2) Using a current probe Waveform on oscilloscope  $A = 33 \pm_{10}^{2}$ mA	CH-A: ⊘RV2/RP-29P(Y)(D-4) CH-B: ⊘RV4/RP-29P(Y)(D-2) TRIG: TP901/DM-56P(C-1)

12-3-4. Y-REC RF Frequency Response Adjustment

- Before performing this adjustment, perform Sec. 12-6-1 through 12-6-11.

【Connection】

SWEEP GENERATOR (VS12AX or the equivalent)



【Setting】

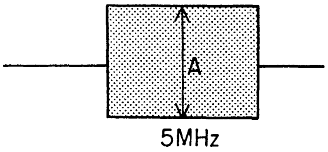
(For example)

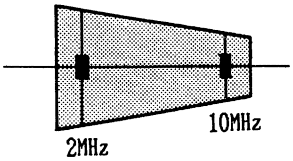
- VS12AX (Manufacturer: SHIBASOKU)

NTSC/PAL	PAL
COMB/NORM	NORM
SWEEP H/V	V
VAR MARKER	ON, 5.0MHz
FIXED MARKER	OFF
TRIG HD/VD	VD
SIGNAL SELECT	
SWEEP CHROMA/VIDEO	VIDEO
SIGNAL LEVEL	
SYNC	ALL OFF
BURST	ALL OFF
SET UP	ALL OFF
ATTENUATOR	ALL OFF

- OSCILLOSCOPE

BAND WIDTH LIMIT	OFF

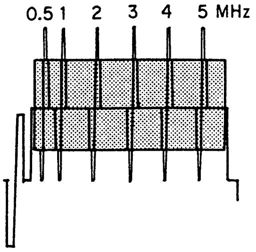
machine conditions for adjustment	specifications	adjustments
Step 1 • POWER OFF • After this step adjustment is completed, do not touch the controls and switches other than the MARKER switches of the VS12AX.	TP2/RP-29P(Y)(E-4) Sweep signal level setting  A = 0.50 ± 0.05 Vp-p (at 5 MHz)	VIDEO LEVEL VR/VS12AX TRIG: TP901/DM-56P(C-1)

<table>
<tr>
<td>Step 2
• Remove SP1(C-3) and SP2(C-2) on the RP-29P(Y) board.
• Using a shorting clip, short between TP3 and TP4, and TP5 and TP6.
• Insert the BCT-20M cassette tape.
• MODE: REC
• VAR MARKER/VS12AX: OFF
2MHz and 10MHz
• MARKER/VS12AX: 2MHz ON
10MHz ON</td>
<td>CH-A: TP3-TP4/RP-29P(Y)(C-3)(C-3)
CH-B: TP5-TP6/RP-29P(Y)(C-2)(C-2)
Using a current probe


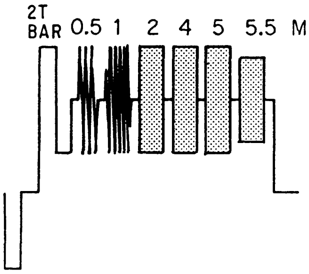
<table><tr><th>Freq.</th><th>Level</th></tr><tr><td>2 MHz
10 MHz</td><td>100 %(Ref.)
$55 \pm^{30}_{10}\%$</td></tr></table></td>
<td>CH-A:
⊘RV7/RP-29P(Y)(C-4)
CH-B:
⊘RV9/RP-29P(Y)(C-2)</td>
</tr>
<tr>
<td>Step 3
• Insert the BCT-20G cassette tape.
• MODE: REC</td>
<td>CH-A: TP3-TP4/RP-29P(Y)(C-3)(C-3)
CH-B: TP5-TP6/RP-29P(Y)(C-2)(C-2)
<table><tr><th>Freq.</th><th>Level</th></tr><tr><td>2 MHz
10 MHz</td><td>100 %(Ref.)
52 ±15%</td></tr></table></td>
<td>CH-A:
⊘RV8/RP-29P(Y)(C-4)
CH-B:
⊘RV10/RP-29P(Y)(C-2)
TRIG: TP901/DM-56P</td>
</tr>
<tr>
<td>Step 4
• After adjustment is completed, remove the shorting clips and insert SP1 and SP2.</td>
<td>Check that the secondary distortion, recording current, and PB frequency response satisfy the specification. When the specification is not satisfied, readjust Sections 12-3-2 through 12-3-4.</td>
<td></td>
</tr>
</table>

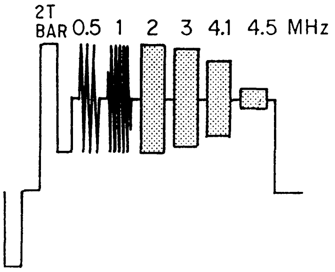
12-3-5. Y-OA Frequency Response Check

- Before performing this adjustment, perform Sec. 12-6-1 through 12-6-11.

<table>
<tr><th>machine conditions for adjustment</th><th>specifications</th><th>adjustments</th></tr>
<tr><td>Step 1
• INPUT SELECT sw: CTDM
• Supply a 60% H. sweep signal to the DUB/COMPONENT 1 IN connector.
• Insert the BCT-20M cassette tape.
• MODE: REC/PB
• Push FIELD SELECT 1 + 3 on the WFM (For CH-A)
• Push FIELD SELECT 2 + 4 on the WFM (For CH-B)</td><td>DUB/COMPONENT 1 Y OUT


Observe the level of the waveform in the moire center.
<table><tr><th>Freq.</th><th>Level</th></tr><tr><td>0.5MHz</td><td>100%(Ref.)</td></tr><tr><td>1.0MHz</td><td>100 ± 4%</td></tr><tr><td>2.0MHz</td><td>100 ± 4%</td></tr><tr><td>3.0MHz</td><td>100 ± 4%</td></tr><tr><td>4.0MHz</td><td>100 ± 4%</td></tr><tr><td>5.0MHz</td><td>100 ± 4%</td></tr></table>
• Level difference between CH-A and CH-B should be less than 5%.
• When the specification is not satisfied, perform the following steps.
• However, Step 4 in Sec. 12-3-4 should be also performed.</td><td>TRIG: INT</td></tr>
<tr><td>Step 1-1</td><td>When the CH-A level is low, perform Step 2 and 4 in Sec. 12-3-4, and raise the 10MHz level of CH-A. If the specification is not satisfied, readjust according to Sec. 12-3-2 and repeat the above steps.</td><td></td></tr>
<tr><td>Step 1-2</td><td>When the CH-A level is high, perform Step 2 and 4 in Sec. 12-3-4, and lower the 10MHz level of CH-A. If the specification is not satisfied, readjust according to Sec. 12-3-2 and repeat the above steps.</td><td></td></tr>
<tr><td>Step 1-3</td><td>When the CH-B level is low, perform Step 1-1 on CH-B.</td><td></td></tr>
<tr><td>Step 1-4</td><td>When the CH-B level is high, perform Step 1-2 on CH-B.</td><td></td></tr>
</table>

<table>
<tr>
<td>Step 2
- INPUT SELECT sw: Y-R, B
- Supply a multi burst signal (METAL) to the COMPONENT 2 Y IN connector.
- Insert the BCT-20M cassette tape.
- MODE: REC/PB
- Push FIELD SELECT 1 + 3 on the WFM (For CH-A).
- Push FIELD SELECT 2 + 4 on the WFM (For CH-B).</td>
<td>COMPONENT 2 Y OUT

Observe the level of the waveform in the moire center.
<table>
<tr><th>Freq.</th><th>Level</th></tr>
<tr><td>2T bar</td><td>100 % (Ref.)</td></tr>
<tr><td>0.5MHz</td><td>100 ± 4%</td></tr>
<tr><td>1.0MHz</td><td>100 ± 4%</td></tr>
<tr><td>2.0MHz</td><td>100 ± 4%</td></tr>
<tr><td>4.0MHz</td><td>100 ± 4%</td></tr>
<tr><td>5.0MHz</td><td>98 ± 4%</td></tr>
<tr><td>5.5MHz</td><td>75% or more</td></tr>
</table>
- Level difference between CH-A and CH-B should be less than 5%.
- When the specification is not satisfied, perform the following steps.
- However, Step 4 in Sec. 12-3-4 should be also performed.</td>
<td>TRIG: INT</td>
</tr>
<tr>
<td>Step 2-1</td>
<td>When the CH-A level is low, perform Step 2 and 4 in Sec. 12-3-4, and raise the 10MHz level of CH-A. If the specification is not satisfied, readjust according to Sec. 12-3-2 and repeat the above steps.</td>
<td></td>
</tr>
<tr>
<td>Step 2-2</td>
<td>When the CH-A level is high, perform Step 2 and 4 in Sec. 12-3-4, and lower the 10MHz level of CH-A. If the specification is not satisfied, readjust according to Sec. 12-3-2 and repeat the above steps.</td>
<td></td>
</tr>
<tr>
<td>Step 2-3</td>
<td>When the CH-B level is low, perform Step 2-1 on CH-B.</td>
<td></td>
</tr>
<tr>
<td>Step 2-4</td>
<td>When the CH-B level is high, perform Step 2-2 on CH-B.</td>
<td></td>
</tr>
<tr>
<td>Step 3</td>
<td>- Repeat Step 1 and Step 2 until the specification is satisfied.</td>
<td></td>
</tr>
</table>

<table>
<tr><td>Step 4
• Insert the BCT-20G cassette tape.
• MODE: REC/PB
• Supply a multi burst signal (OXIDE) to the COMPONENT 2 Y IN connector.
• INPUT SELECT sw: Y-R, B
• Push FIELD SELECT 1 + 3 on the WFM (For CH-A).
• Push FIELD SELECT 2 + 4 on the WFM (For CH-B).</td><td>COMPONENT 2 Y OUT


Observe the level of the waveform in the moire center.
<table><tr><th>Freq.</th><th>Level</th></tr><tr><td>2T bar</td><td>100 % (Ref.)</td></tr><tr><td>0.5MHz</td><td>100 ± 4%</td></tr><tr><td>1.0MHz</td><td>100 ± 4%</td></tr><tr><td>2.0MHz</td><td>98 ± 5%</td></tr><tr><td>3.0MHz</td><td>85 $\pm^{5}_{3}$%</td></tr><tr><td>4.1MHz</td><td>60% or more</td></tr><tr><td>4.5MHz</td><td>——</td></tr></table>
• When the specification is not satisfied, perform the following steps.
• However, Step 4 in Sec. 12-3-4 should be also performed.</td><td>TRIG: INT</td></tr>
<tr><td>Step 4-1</td><td>When the CH-A level is low, perform Step 3 and 4 in Sec. 12-3-4, and raise the 10MHz level of CH-A. If the specification is not satisfied, readjust according to Sec. 12-3-3 and repeat the above steps.</td><td></td></tr>
<tr><td>Step 4-2</td><td>When the CH-A level is high, perform Step 3 and 4 in Sec. 12-3-4, and lower the 10MHz level of CH-A. If the specification is not satisfied, readjust according to Sec. 12-3-3 and repeat the above steps.</td><td></td></tr>
<tr><td>Step 4-3</td><td>When the CH-B level is low, perform Step 4-1 on CH-B.</td><td></td></tr>
<tr><td>Step 4-4</td><td>When the CH-B level is high, perform Step 4-2 on CH-B.</td><td></td></tr>
</table>

12-4. RP-29P (C) BOARD ADJUSTMENT

When adjusting the RP-29P (C) board, set S1 on the AFM-1 board to ON.

After adjustment is completed, set S1 on the AFM-1 board to OFF.

The RP-29P(C) board adjustments are as follows:

12-4-2 C-Metal Recording Current & Secondary Distortion Adjustment
(RV101, RV103, RV105, RV106)
↓
12-4-3 C-Oxide Recording Current & Secondary Distortion Adjustment
(RV102 and RV104)
↓
12-4-4 C-REC RF Frequency Response Adjustment (Steps 1 and 2)
(RV107 and RV109)
↓
12-4-2 C-Metal Recording Current & Secondary Distortion Adjustment (Check)
↓
12-4-4 C-REC RF Frequency Response Adjustment (Step 3)
(RV108 and RV110)
↓
12-4-3 C-Oxide Recording Current & Secondary Distortion Adjustment (Check)
↓
12-4-5 C-OA Frequency Response Check
(When Section 12-4-5 is not satisfied, readjust Section 12-4-2.)
↓
12-4-6 Crosstalk Adjustment

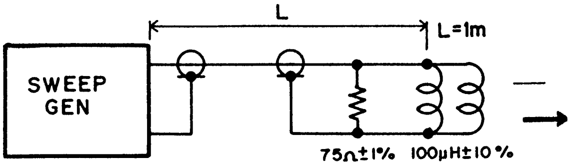
This adjustment cannot be performed without adjusting the DM-56P board.

Note: The "C-PB RF Frequency Response Adjustment" in 12-4-1 is used to adjust the DM-56P board.

12-4-1. C-PB RF Frequency Response Adjustment

- Head coupling tool

  To make this adjustment, stop the head drum rotation without a cassette tape and L-couple the sweep signal with the video head using two inductors (approx. 100 μH × 2).



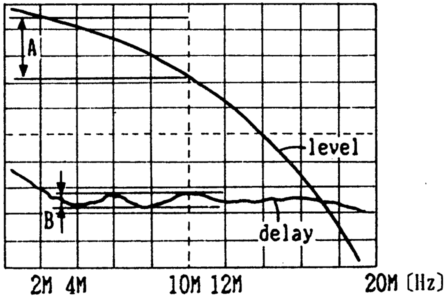
Put the inductors near the video head.

Sweep signal range: 1 to 20 MHz

- Network analyzer

MAG	0.5 dB
DLY	10 nsec
CF	10 MHz
SPAN	20 MHz
ST	4.0 sec
IRG	0 dB
RBW	10 kHz
VBW	10 kHz
DR	1 μsec

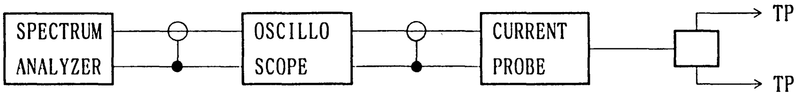
- This adjustment must be adjusted first of play back system.

machine conditions for adjustment	specifications	adjustments
Step 1 • Remove the DM-56P board from the unit, and insert the EX-151 extension board. • Set the network analyzer output to -6 dB. • Connect the network analyzer via oscilloscope to TP107 on the RP-29P(C) board. • MODE: EE • Close the head coupling tool in the R/P C A channel head.	TP107/RP-29P(C)(A-4)  A = -3.5 ± 0.5 dB (Level difference between 2 MHz and 10 MHz) B ≦ 10 nsec (Delay difference between 4 MHz and 12 MHz)	CH-A: ⊘RV111/RP-29P(C)(B-3)

Step 2 • Connect the network analyzer via oscilloscope to TP108 on the RP-29P(C) board. • Close the head coupling tool in the R/P C B channel head. • After adjustment is completed, set the DM-56P board.	TP108/RP-29P(C)(A-1) (GND: E1) A = -3.5 ± 0.5 dB (Level difference between 2 MHz and 10 MHz) B ≦ 10 nsec (Delay difference between 4 MHz and 12 MHz)	CH-B: ⊘RV112/RP-29P(C)(B-1)

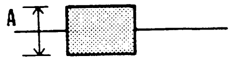
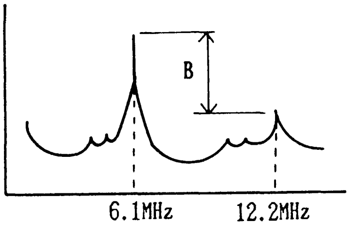
12-4-2. C-Metal Recording Current and Secondary Distortion Adjustments

【Connection】



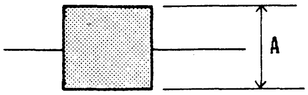
BAND WIDTH LIMIT: OFF

• Before performing this adjustment, perform Sec. 12-6-12 through 12-6-20.

machine conditions for adjustment	specifications	adjustments
• Remove SP101(C-3) and SP102(C-2) on the RP-29P(C) board. • Using a shorting clip, short between TP103 and TP104, and TP105 and TP106. • INPUT SELECT sw: Y-R, B • Supply a 50/50/50 flat field signal to the COMPONENT 2 IN connector. • Insert the BCT-20M cassette tape. • MODE: REC • After adjustment is completed, remove the shorting clips and insert SP101(C-3) and SP102(C-2).	CH-A: TP103-TP104/RP-29P(C)(C-3)(C-3) CH-B: TP105-TP106/RP-29P(C)(C-2)(C-2) Using a current probe Waveform on oscilloscope  A = $60 \pm {}^{2}_{10}$ mA Using an spectrum anlayzer  Minimize 12.2MHz. B ≧ 40 dB	• Level adjustment CH-A: ⊘RV101/RP-29P(C)(D-3) CH-B: ⊘RV103/RP-29P(C)(D-1) • Secondary distortion adjustment CH-A: ⊘RV105/RP-29P(C)(D-3) CH-B: ⊘RV106/RP-29P(C)(D-1) TRIG: TP902/DM-56P(F-1)

12-4-3. C-Oxide Recording Current and Secondary Distortion Adjustments

- Before performing this adjustment, perform Sec. 12-6-12 throuth 12-6-20.

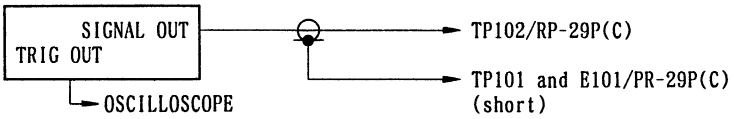
machine conditions for adjustment	specifications	adjustments
• Remove SP101(C-3) and SP102(C-2) on the RP-29P(C)board. • Using a shorting clip, short between TP103 and TP104, and TP105 and TP106. • INPUT SELECT sw: Y-R, B • Supply a 50/50/50 flat field signal to the COMPONENT 2 IN connector. • Insert the BCT-20G cassette tape. • MODE: REC	CH-A: TP103-TP104/RP-29P(C)(C-3)(C-3) CH-B: TP105-TP106/RP-29P(C)(C-2)(C-2) Using a current probe Waveform on oscilloscope  A = 35 ± 5 mA	CH-A: ⊘RV102/RP-29P(C)(D-4) CH-B: ⊘RV104/RP-29P(C)(D-2)
• After adjustment is completed, remove the shorting clips and insert SP101(C-3) and SP102(C-2).		TRIG: TP902/DM-56P(F-1)

12-4-4. C-REC RF Frequency Response Adjustment

- Before performing this adjustment, perform Sec. 12-6-12. through 12-6-20.

【Connection】

SWEEP GENERATOR (VS12AX or the equivalent)


SIGNAL OUT
TRIG OUT
OSCILLOSCOPE
TP102/RP-29P(C)
TP101 and E101/PR-29P(C)
(short)

【Setting】

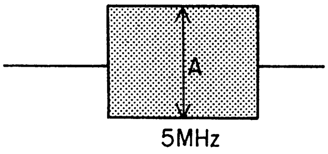
(For example)

- VS12AX (Manufacturer: SIBASOKU)

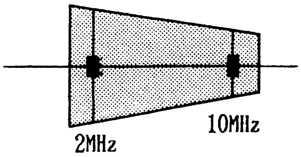
NTSC/PAL	PAL
COMB/NORM	NORM
SWEEP H/V	V
VAR MARKER	ON, 5.0MHz
FIXED MARKER	OFF
TRIG HD/VD	VD
SIGNAL SELECT	
SWEEP CHROMA/VIDEO	VIDEO
SIGNAL LEVEL	
SYNC BURST SETUP	ALL OFF
ATTENUATOR	ALL OFF

- OSCILLOSCOPE

BAND WIDTH LIMIT	OFF

machine conditions for adjustment	specifications	adjustments
Step 1 • POWER OFF. • After this step adjustment is completed, do not toutch the controls and switches other than the MARKER switches of the VS12AX.	TP102/RP-29P(C)(E-4)  A = 0.50 ± 0.05 Vp-p (at 5 MHz)	VIDEO LEVEL VR/VS12AX TRIG: TP902/DM-56P(F-1)

http://getMANUAL.com

<table>
<tr>
<td>Step 2
• Remove SP101(C-3) and SP102(C-2) on the RP-29P(C) board.
• Using a shorting clip, short between TP103 and TP104, and TP105 and TP106.
• Insert the BCT-20M cassette tape.
• MODE: REC
• VAR MARKER/VS12AX: OFF
• MARKER/VS12AX: 2MHz ON
10MHz ON</td>
<td>CH-A: TP103-TP104/RP-29P(C)(C-3)(C-3)
CH-B: TP105-TP106/RP-29P(C)(C-2)(C-2)
Using a current probe


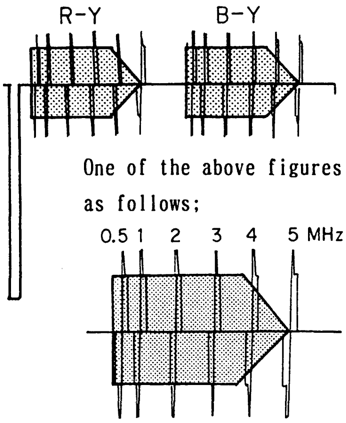
<table><tr><th>Freq.</th><th>Level</th></tr><tr><td>2 MHz
10MHz</td><td>100 % (Ref.)
70 ± $^{13}_{17}$ %</td></tr></table></td>
<td>• METAL
CH-A:
⊘RV107/RP-29P(C)(C-4)
CH-B:
⊘RV109/RP-29P(C)(C-2)

TRIG: TP902/DM-56P(F-1)</td>
</tr>
<tr>
<td>Step 3
• Insert the BCT-20G cassette tape.
• MODE: REC</td>
<td>TP103-TP104/RP-29P(C)(C-3)(C-3)
TP105-TP106/RP-29P(C)(C-2)(C-2)
<table><tr><th>Freq.</th><th>Level</th></tr><tr><td>2 MHz
10 MHz</td><td>100 % (Ref.)
60 ± $^{10}_{15}$ %</td></tr></table></td>
<td>• OXIDE
CH-A;
⊘RV108/RP-29P(C)(C-4)
CH-B;
⊘RV110/RP-29P(C)(C-2)</td>
</tr>
<tr>
<td>Step 4

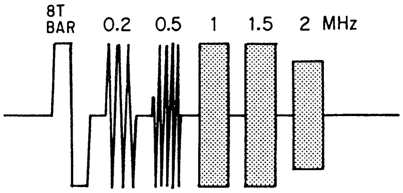
• After adjustment is completed, remove the shorting clips and insert SP101(C-3) and SP102(C-2).</td>
<td>Check that the secondary distortion, recording current, and PB frequency response satisfy the specification.
If the specification is not satisfied, readjust Sections 12-4-2 through 12-4-4.</td>
<td></td>
</tr>
</table>

12-4-5. C-OA Frequency Response Check

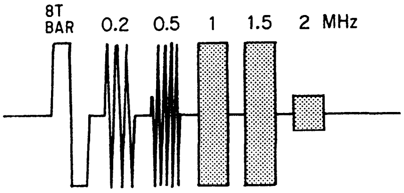
- Before performing this adjustment, perform Sec. 12-6-12 through 12-6-20.

<table>
<tr><th>machine conditions for adjustment</th><th>specifications</th><th>adjustments</th></tr>
<tr><td>Step 1
• INPUT SELECT sw: CTDM
• Supply a 60% H. sweep signal to the DUB/COMPONENT 1 IN connector.
• Insert the BCT-20M cassette tape.
• MODE: REC/PB
• Push FIELD SELECT 1 + 3 on the WFM (For CH-A).
• Push FIELD SELECT 2 + 4 on the WFM (For CH-B).</td><td>DUB/COMPONENT 1 R-Y/B-Y OUT


One of the above figures is expanded as follows;
Observe the level of the waveform in the moire centor.
<table>
<tr><th>Freq.</th><th>Level</th></tr>
<tr><td>0.5MHz</td><td>100% (Ref.)</td></tr>
<tr><td>1.0MHz</td><td>100 ± 4%</td></tr>
<tr><td>2.0MHz</td><td>100 ± 4%</td></tr>
<tr><td>3.0MHz</td><td>98 ± 4%</td></tr>
<tr><td>4.0MHz</td><td>75% or more</td></tr>
</table>
• Level difference between CH-A and CH-B should be less than 5%.
• When the specification is not satisfied, perform the following steps.
• However, Step 4 in Sec. 12-4-4 should be also performed.</td><td>TRIG: TP401/DM-56P(E-6)</td></tr>
<tr><td>Step 1-1</td><td>When the CH-A level is low, perform Step 2 and 4 in Sec. 12-4-4, and raise the 10kHz level of CH-A.
If the specification is not satisfied, readjust according to Sec. 12-4-2 and repeat the above steps.</td><td></td></tr>
<tr><td>Step 1-2</td><td>When the CH-A level is high, perform Step 2 and 4 in Sec. 12-4-4, and lower the 10kHz level of CH-A.
If the specification is not satisfied, readjust according to Sec. 12-4-2 and repeat the above steps.</td><td></td></tr>
<tr><td>Step 1-3</td><td>When the CH-B level is low, perform Step 1-1 on CH-B.</td><td></td></tr>
<tr><td>Step 1-4</td><td>When the CH-B level is high, perform Step 1-2 on CH-B.</td><td></td></tr>
</table>

<table>
<tr><td>Step 2
• INPUT SELECT sw: Y-R, B
• Supply a multi burst signal to the COMPONENT 2 IN connector.
• Insert the BCT-20M cassette tape.
• MODE: REC/PB
• Push FIELD SELECT 1 + 3 on the WFM (For CH-A).
• Push FIELD SELECT 2 + 4 on the WFM (For CH-B).</td><td>COMPONENT 2 R-Y, B-Y OUT


Observe the level of the waveform in the moire center.
<table>
<tr><th>Freq.</th><th>Level</th></tr>
<tr><td>8T bar</td><td>100% (Ref.)</td></tr>
<tr><td>0.2MHz</td><td>100 ± 4%</td></tr>
<tr><td>0.5MHz</td><td>100 ± 4%</td></tr>
<tr><td>1.0MHz</td><td>100 ± 4%</td></tr>
<tr><td>1.5MHz</td><td>98 ± 4%</td></tr>
<tr><td>2.0MHz</td><td>75% or more</td></tr>
</table>
• Check that both the values in R-Y and B-Y satisfy the specification.
• When the specification is not satisfied, perform the following steps.
• However, Step 4 in Sec. 12-4-4 should be also performed.</td><td>TRIG: COMPONENT 2 Y OUT</td></tr>
<tr><td>Step 2-1</td><td>When the CH-A level is low, perform Step 2 and 4 in Sec. 12-4-4, and raise the 10kHz level of CH-A.
If the specification is not satisfied, readjust according to Sec. 12-4-2 and repeat the above steps.</td><td></td></tr>
<tr><td>Step 2-2</td><td>When the CH-A level is high, perform Step 2 and 4 in Sec. 12-4-4, and lower the 10kHz level of CH-A.
If the specification is not satisfied, readjust according to Sec. 12-4-2 and repeat the above steps.</td><td></td></tr>
<tr><td>Step 2-3</td><td>When the CH-B level is low, perform Step 2-1 on CH-B.</td><td></td></tr>
<tr><td>Step 2-4</td><td>When the CH-B level is high, perform Step 2-2 on CH-B.</td><td></td></tr>
<tr><td>Step 3</td><td>• Repeat Step 1 and 2 until the specification is satisfied.</td><td></td></tr>
</table>

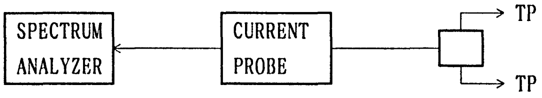
<table>
<tr>
<td>Step 4
• Insert the BCT-20G cassette tape.
• MODE: REC/PB
• INPUT SELECT sw: Y-R, B
• Supply a multi burst signal to the COMPONENT 2 R-Y, B-Y IN connector.
• Push FIELD SELECT 1 + 3 on the WFM (For CH-A).
• Push FIELD SELECT 2 + 4 on the WFM (For CH-B).</td>
<td>COMPONENT 2 R-Y, B-Y OUT


Observe the level of the waveform in the moire center.
<table>
<tr><th>Freq.</th><th>Level</th></tr>
<tr><td>8T bar</td><td>100% (Ref.)</td></tr>
<tr><td>0.2MHz</td><td>100 ± 4%</td></tr>
<tr><td>0.5MHz</td><td>100 ± 4%</td></tr>
<tr><td>1.0MHz</td><td>90 ± 5%</td></tr>
<tr><td>1.5MHz</td><td>70% or more</td></tr>
</table>
• Check that both the values in R-Y and B-Y satisfy the specification.
• When the specification is not satisfied, perform the following step.</td>
<td>TRIG: COMPONENT 2 Y OUT</td>
</tr>
<tr>
<td>Step 4-1</td>
<td>When the CH-A level is low, perform Step 2 and 4 in Sec. 12-4-4, and raise the 10kHz level of CH-A.
If the specification is not satisfied, readjust according to Sec. 12-4-3 and repeat the above steps.</td>
<td></td>
</tr>
<tr>
<td>Step 4-2</td>
<td>When the CH-A level is high, perform Step 2 and 4 in Sec. 12-4-4, and lower the 10kHz level of CH-A.
If the specification is not satisfied, readjust according to Sec. 12-4-3 and repeat the above steps.</td>
<td></td>
</tr>
<tr>
<td>Step 4-3</td>
<td>When the CH-B level is low, perform Step 4-1 on CH-B.</td>
<td></td>
</tr>
<tr>
<td>Step 4-4</td>
<td>When the CH-B level is high, perform Step 4-2 on CH-B.</td>
<td></td>
</tr>
</table>

12-4-6. Crosstalk Adjustment

- Before performing this adjustment, perform Sec. 12-6-12 through 12-6-20.
- This adjustment is made after all RP-29P(Y), RP-29P(C) board adjustments are completed.

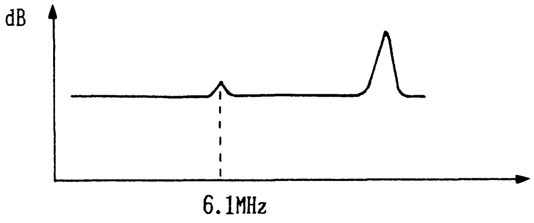
【Connection】



【Setting】

- Spectrum Analyzer

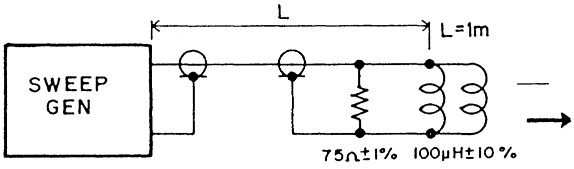
CENTER	5 MHz
SPAN	10 MHz
RBW	100 kHz
VBW	10 Hz
SWEEP TIME	5 sec

machine conditions for adjustment	specifications	adjustments
Step 1 • INPUT SELECT sw: Y-R, B • Supply a 50/50/50 flat field signal to the COMPONENT 2 IN connector. • Remove SP1(C-3) and SP2(C-3) on the RP-29P(Y) board. • Using a shorting clips, short between TP3 and TP4, and TP5 and TP6. • Using a shorting clip, short between TP1 and E1. • Connect a current probe to TP3 and TP4 on the RP-29P(Y) board. • Insert the BCT-20M cassette tape. • MODE: REC	TP3-TP4/RP-29P(Y)(C-3)(C-3)  Minimize the 6.1 MHz crosstalk	• CH-A ⊘RV13/RP-29P(Y)(E-4)
Step 2 • Set as in Step 1 and connect a current probe to TP5 and TP6 on the RP-29P(Y) board. • After adjustment is completed, remove the shorting clips and insert SP1(C-3) and SP2(C-2).	TP5-TP6/RP-29P(Y)(C-2)(C-2) Minimize the 6.1MHz crosstalk	• CH-B ⊘RV14/RP-29P(Y)(E-2)

12-5. PA-68BP BOARD ADJUSTMENT

- Head coupling tool

To make this adjustment, stop the head drum rotation without a cassette taape and L-couple the sweep signal with the video head using two inductors (approx. 100 μH × 2).



→ Put the inductors near the video head.

Sweep signal range: 1 to 20 MHz

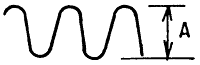
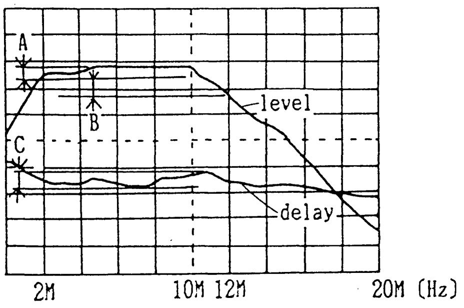
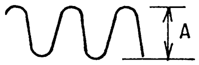
- Network Analyzer

MAG	0.5 dB
DLY	10 nsec
CF	10 MHz
SPAN	20 MHz
ST	4.0 sec
IRG	0 dB
RBW	10 kHz
VBW	10 kHz
DR	1 μsec

- Set the setup menu Item 907 "CONFI SELECT IN PB MODE" to data number 1 "ENABLE".
- After this board adjustment is completed, the switch should be returned to the factory setting position.

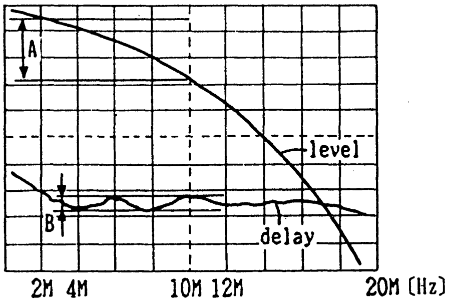
12-5-1. Y CONFI RF Frequency Response Adjustment

- Before performing this adjustment, perform Sec. 12-3-1 and 12-4-1.

machine conditions for adjustment	specifications	adjustments
Step 1 • CONFI sw: ON • Close the head coupling tool in the CONFI Y A channel head. • MODE: EE • Connect the network analyzer Via an oscilloscope the CN110-6C on the DM-56P Board. • Adjust OUTPUT LEVEL of the network analyzer. TP3/DM-56P(C-4)  A = 0.7 ± 0.1 Vp-p (6 MHz through 8 MHz portion)	CN110-6C/DM-56P  A ≦ 0.5 dB (Level difference between 2 MHz and 10MHz) C ≦ 10 nsec (Delay difference between 3 MHz and 12MHz) B ≦ 1 dB (Level difference between 2 MHz and 12MHz)	CH-A: ⊘RV1/PA-68BP(upper drum)
Stpe 2 • Close the head coupling tool in the CONFI Y B channel head. • Connect the network analyzer Via an oscilloscope the CN110-10C on the DM-56P Board. • Adjust OUTPUT LEVEL of the network analyzer. TP3/DM-56P(C-4)  A = 0.7 ± 0.1 Vp-p (6 MHz through 8 MHz portion)	CN110-10C/DM-56P(B-7) A ≦ 0.5 dB (Level difference between 2 MHz and 10MHz) C ≦ 10 nsec (Delay difference between 3 MHz and 12MHz) B ≦ 1 dB (Level difference between 2 MHz and 12MHz)	CH-B: ⊘RV2/PA-68BP(upper drum)

12-5-2. C CONFI RF Frequency Response Adjustment

- Before performing this adjustment, perform Sec. 12-3-1 and 12-4-1.

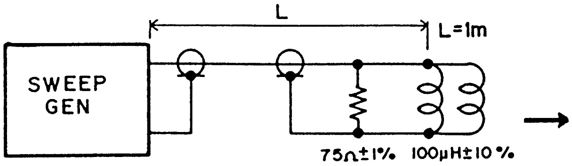
machine conditions for adjustment	specifications	adjustments
Step 1 • CONFI sw: ON • MODE: EE • Remove the DM-56P board from the unit, and insert the EX-151 extension board. • Set the network analyzer output to -6dB. • Connect the network analyzer Via an oscilloscope to CN3-15C on the EX-151 board. • Close the head coupling tool in the CONFI C A channel head.	CN3-15C/EX-151  A ≦ -4.0 ± 0.5 dB (Level difference between 2 MHz and 10MHz) B ≦ 10 nsec (Delay difference between 4 MHz and 12MHz)	CH-A: ⊘RV3/PA-68BP(upper drum)
Step 2 • Connect the network analyzer Via an oscilloscope to CN3-19C on the EX-151 board. • Close the head coupling tool in the CONFI C B channel head. • After adjustment is completed, set the DM-56P board.	CN3-19C/EX-151 A ≦ -4.0 ± 0.5 dB (Level difference between 2 MHz and 10MHz) B ≦ 10 nsec (Delay difference between 4 MHz and 12MHz)	CH-B: ⊘RV4/PA-68BP(upper drum)

12-6. DM-56P BOARD ADJUSTMENT

12-6-1. Y RF Phase Equalizer Adjustment

- Head coupling tool

To make this adjustment, stop the head drum rotation without a cassette tape and L-couple the sweep signal with the video head using two inductors (approx. 100 μH × 2).

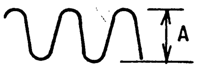
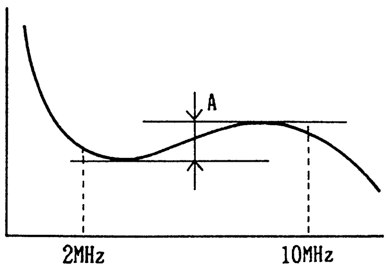


→ Put the inductors near the video head.

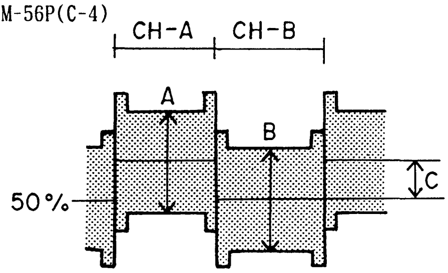
Sweep signal range: 1 to 20 MHz

- Network Analyzer

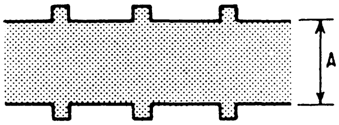
MAG	0.5 dB	IRG	0 dB
DLY	10 nsec	RBW	10 kHz
CF	10 MHz	VBW	10 kHz
SPAN	20 MHz	DR	1 μsec
ST	4.0 sec		

machine conditions for adjustment	specifications	adjustments
• Adjust OUTPUT LEVEL of the network analyzer. TP3/DM-56P(C-4)  A = 0.7 ± 0.1 Vp-p (6 MHz through 8 MHz portion) • Connect the network analyzer via an oscilloscope to TP104/DM-56P, and measure the group delay. • Close the head coupling tool in the R/P Y A channel head. • MODE: EE • SP101/DM-56P(A-2): SHORT • SP102/DM-56P(A-2): OPEN • After adjustment is completed, set SP101 and SP102 on the DM-56P board to the former position. • SP101/DM-56P(A-2): OPEN • SP102/DM-56P(A-2): SHORT • Repeatedly turn the power on and off until the waveform appears.	TP104/DM-56P(C-1)  A = 0 ± 5 nsec (Delay difference between 2MHz and 10MHz)	⊘RV15/DM-56P(C-3)

12-6-2. Y RF COS. Equalizer Input Level Adjustment

machine conditions for adjustment	specifications	adjustments
Step 1 • Play back a flat field signal on alignment tape CR5-1B PS. • Turn the TRACKING control so that the output waveform level is maximized.	TP3/DM-56P(C-4)  Measured in the V center. A = B = 0.7 ± 0.05 Vp-p C = 0 ± 0.04 Vdc	CH-A: ⊘RV3/DM-56P(B-5) CH-B: ⊘RV8/DM-56P(C-5) DC level: ⊘RV4/DM-56P(C-5) TRIG(-): TP901/DM-56P(C-1)
Step 2 • Set the setup menu Item 907 to 1. • CONFI sw: ON • After adjustment is completed, set the setup menu Item 907 to 0 and CONFI switch to OFF.	A = B = 0.7 ± 0.05 Vp-p	CH-A: ⊘RV2/DM-56P(B-6) CH-B: ⊘RV7/DM-56P(C-6) TRIG(-): TP901/DM-56P(C-1)

12-6-3. Y RF AGC Output Level Adjustment

machine conditions for adjustment	specifications	adjustments
• Play back a flat field signal on alignment tape CR5-1B PS. • Turn the TRACKING control so that the output waveform level is maximized.	TP101/DM-56P(A-2)  Measured in the V center. A = 1.0 ± 0.04 Vp-p	⊘RV101/DM-56P(A-2) TRIG: TP901/DM-56P(C-1)

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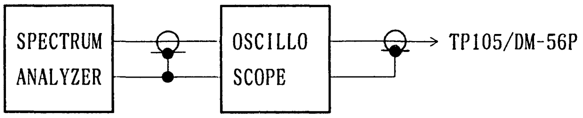
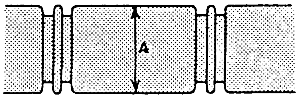
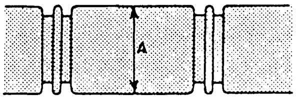
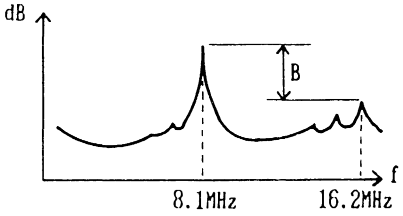
12-6-4. Y HF Input Level and Balance Adjustments

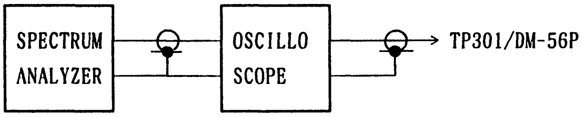
【Connection】(Step 3)

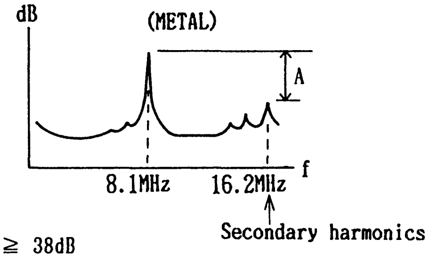
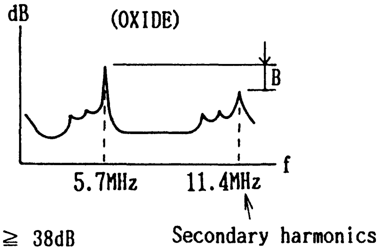


machine conditions for adjustment	specifications	adjustments
Step 1 • Play back a flat field signal on alignment tape CR5-1B PS.	TP104/DM-56P(C-1)  Measured in the V center. A = 160 ± 10 mVp-p	⊘RV103/DM-56P(B-2) TRIG: TP901/DM-56P(C-1)
Step 2 • Play back a pulse & bar signal on alignment tape CR5-2A PS.	TP104/DM-56P(C-1)  Measured in the V center. A = 160 ± 10 mVp-p	⊘RV102/DM-56P(B-1) TRIG: TP901/DM-56P(C-1)
Step 3 • Play back a flat field signal on alignment tape CR5-1B PS. • Connect the spectrum analyzer via oscilloscope to TP105 on the DM-56P board.	TP105/DM-56P(D-1)  Maximize B level. B ≧ 40 dB	⊘RV104/DM-56P(C-1)

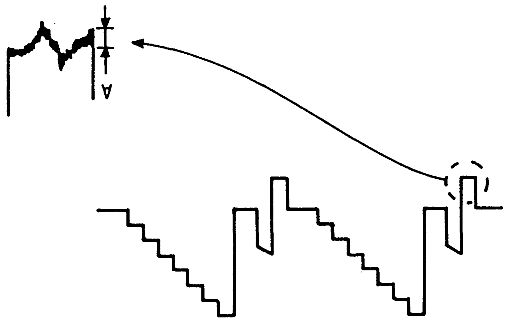
12-6-5. Y Limiter Balance Adjustment

【Connection】


SPECTRUM ANALYZER
OSCILLO SCOPE
TP301/DM-56P

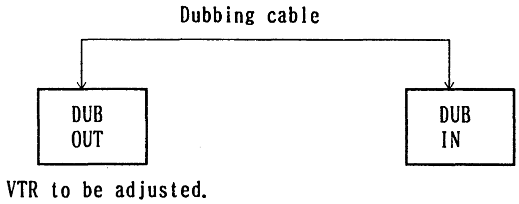
machine conditions for adjustment	specifications	adjustments
Step 1 • INPUT SELECT sw: Y-R, B • PB • PB/EE SW: PB/EE • Supply a 50/50/50 flat field signal to the COMPONENT 2 IN connector. • MODE: EE • Connect the spectrum analyzer via oscilloscope to TP301 on the DM-56P board.	TP301/DM-56P(E-1)  A ≧ 38dB	⊘RV301/DM-56P(D-1)
Step 2 • Insert the BCT-20G cassette tape. • MODE: EE	 B ≧ 38dB	

12-6-6. Y Demodulator Balance Adjustment

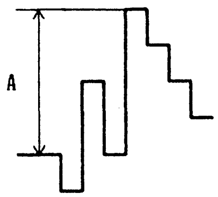
machine conditions for adjustment	specifications	adjustments
• INPUT SELECT sw: Y-R, B • PB • PB/EE sw: PB/EE • Supply a 100% color-bars signal to the COMPONENT 2 IN connector. • MODE: STOP • Insert the BCT-20G cassette tape.	TP401/DM-56P(E-6)  Minimize the carrier leak. Measurement should be made in the noise peak level. A ≦ 35 mVp-p	⊘RV302/DM-56P(E-1) TRIG: TP401/DM-56P(E-6)

12-6-7. Y DUB OUT Level Adjustment

【Connection】

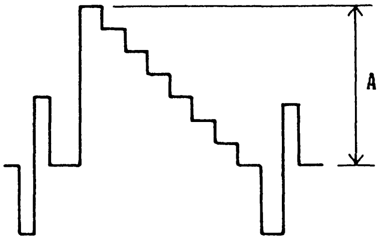


Connect using a dubbing cable as illustrated.

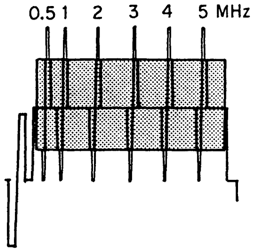
machine conditions for adjustment	specifications	adjustments
Step 1 • Connect the DUB OUT and DUB IN connectors using a dubbing cable. • Play back a 100% color-bars signal on alignment tape CR5-1B PS.	TP408/DM-56P(D-7)  A = 0.7 ± 0.01 Vp-p	⊘RV305/DM-56P(D-5) TRIG: TP408/DM-56P(D-7)
Step 2 • Play back a color-bars signal on alignment tape CR5-2A PS.	A = 0.7 ± 0.01 Vp-p	⊘RV304/DM-56P(D-4) TRIG: TP408/DM-56P(D-7)

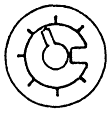
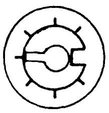
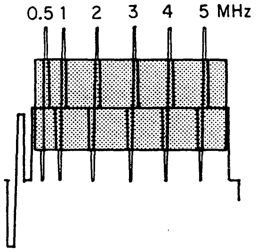
12-6-8. Y Demodulator Output Level Adjustment

- Before perform this adjustment, the Y DUB OUT Level Adjustment (Section 12-6-7) should be completed.

machine conditions for adjustment	specifications	adjustments
• Play back a 100% color-bars signal on alignment tape CR5-1B PS.	TP402/DM-56P(E-6)  A = 0.7 ± 0.01 Vp-p	⊘RV401/DM-56P(E-6) TRIG: TP402/DM-56P(E-6)

12-6-9. Y Video Frequency Response Adjustment

<table>
<tr><th>machine conditions for adjustment</th><th>specifications</th><th>adjustments</th></tr>
<tr>
<td>Step 1
• INPUT SELECT sw: CTDM
• Supply a 60% H. sweep signal to the DUB/COMPONENT 1 IN connector.</td>
<td>TP401/DM-56P(E-6)


Observe the level of the waveform in the moire center.
<table>
<tr><th>Freq.</th><th>Level</th></tr>
<tr><td>0.5MHz</td><td>100 %(Ref.)</td></tr>
<tr><td>1.0MHz</td><td>100 ± 3 %</td></tr>
<tr><td>2.0MHz</td><td>100 ± 3 %</td></tr>
<tr><td>3.0MHz</td><td>100 ± 3 %</td></tr>
<tr><td>4.0MHz</td><td>100 ± 3 %</td></tr>
<tr><td>5.0MHz</td><td>100 ± 5 %</td></tr>
</table>
</td>
<td>⊘CV347(C347)/DM-56P(D-5)
TRIG: INT</td>
</tr>
<tr>
<td>Step 2
• Play back a 60% H. sweep (CTDM) signal on alignment tape CR5-1B PS.
• Set RV107 and RV106 as follows:

RV107

RV106
• Push FIELD SELECT 1 + 3 on the WFM (For CH-A).
• Push FIELD SELECT 2 + 4 on the WFM (For CH-B).</td>
<td>TP401/DM-56P(E-6)


Observe the level of the waveform in the moire center.
<table>
<tr><th>Freq.</th><th>Level</th></tr>
<tr><td>0.5MHz</td><td>100 % (Ref.)</td></tr>
<tr><td>1.0MHz</td><td>100 ± 4 %</td></tr>
<tr><td>2.0MHz</td><td>100 ± 4 %</td></tr>
<tr><td>3.0MHz</td><td>100 ± 4 %</td></tr>
<tr><td>4.0MHz</td><td>100 ± 4 %</td></tr>
<tr><td>5.0MHz</td><td>100 ± 4 %</td></tr>
</table>
</td>
<td>CH-A:
⊘RV1/EQ-26/DM-56P(B-5)
CH-B:
⊘RV2/EQ-26/DM-56P(B-5)
TRIG: INT</td>
</tr>
</table>

Step 3

- Set the setup menu Item 907 to 1.
- CONFI sw: ON
- Play back a 60% H.sweep (CTDM) signal on alignment tape CR5-1B PS.
- Push FIELD SELECT 1 + 3 on the WFM (For CH-A).
- Push FIELD SELECT 2 + 4 on the WFM (For CH-B).
- After adjustment is completed, set the setup menu Item 907 to 0 and CONFI switch to OFF.

TP401/DM-56P(E-6)

Observe the level of the waveform in the moire center.

Freq.	Level
0.5MHz	100 % (Ref.)
1.0MHz	100 ± 4 %
2.0MHz	100 ± 4 %
3.0MHz	100 ± 4 %
4.0MHz	100 ± 4 %
5.0MHz	100 ± 4 %

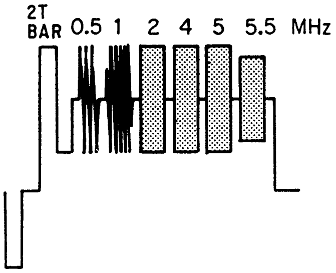
CH-A:
⊘RV3/EQ-26/DM-56P(B-5)
CH-B:
⊘RV4/EQ-26/DM-56P(B-5)

TRIG: INT

Step 4

- Play back a multi burst signal on alignment tape CR5-1B PS.

COMPONENT 2 Y OUT



Observe the level of the waveform in the moire center.

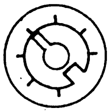
Freq.	Level
2T bar	100 % (Ref.)
0.5MHz	100 ± 4 %
1.0MHz	100 ± 4 %
2.0MHz	100 ± 4 %
4.0MHz	100 ± 4 %
5.0MHz	98 ± 6 %
5.5MHz	75 % or more

⊘RV250/TBC-12P(B-1)

TRIG: INT

Step 5

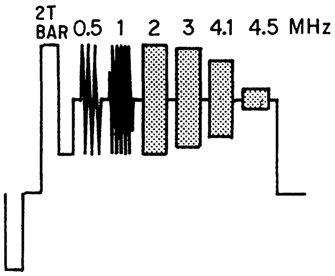
- Play back a multi burst signal on alignment tape CR5-2A PS.
- Set RV105 as follows:



RV105

- Push FIELD SELECT 1 + 3 on the WFM (For CH-A).
- Push FIELD SELECT 2 + 4 on the WFM (For CH-B).

COMPONENT 2 Y OUT



Observe the level of the waveform in the moire center.

Freq.	Level
2T bar	100 % (Ref.)
0.5MHz	100 ± 4 %
1.0MHz	100 ± 4 %
2.0MHz	98 ± 5 %
3.0MHz	90 ± 5 %
4.1MHz	60 % or more
4.5MHz	———

CH-A:
⊘RV5/EQ-26/DM-56P(B-5)
CH-B:
⊘RV6/EQ-26/DM-56P(B-5)

TRIG: INT

Step 6

- CONFI sw: ON
- Set the setup menu Item 907 to 1.
- Play back a multi burst signal on alignment tape CR5-2A PS.
- DT SELECT sw: VAR
- Push FIELD SELECT 1 + 3 on the WFM (For CH-A).
- Push FIELD SELECT 2 + 4 on the WFM (For CH-B).
- After adjustment is completed, set the setup menu Item 907 to 0 and CONFI switch to OFF.

COMPONENT 2 Y OUT

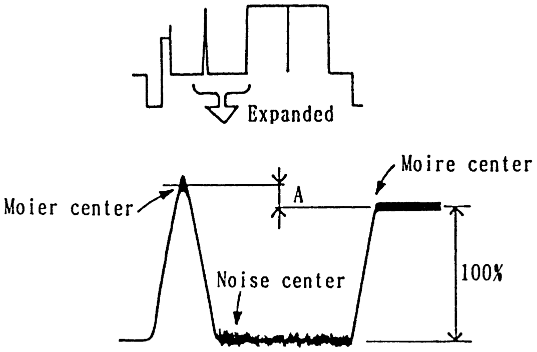
Observe the level of the waveform in the moire center.

Freq.	Level
2T bar	100 % (Ref.)
0.5MHz	100 ± 4 %
1.0MHz	100 ± 4 %
2.0MHz	98 ± 5 %
3.0MHz	90 ± 5 %
4.1MHz	60 % or more
4.5MHz	———

CH-A:
⊘RV7/EQ-26/DM-56P(B-5)
CH-B:
⊘RV8/EQ-26/DM-56P(B-5)

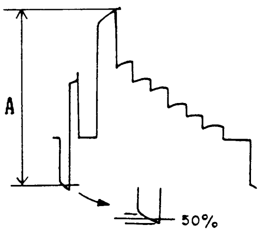
TRIG: INT

12-6-10. Y HF Gain Adjustment

machine conditions for adjustment	specifications	adjustments
Step 1 • Play back a pulse & bar (CTDM) signal on alignment tape CR5-1B PS. • FIELD SELECT/WFM: OFF	TP402/DM-56P(E-6)  Expanded Moire center Moier center A Noise center 100% $A = +2 \pm {}^{1}_{0}$ % Higher pulse is assumed to be pulse-signed.	⊘RV106/DM-56P(C-1) TRIG: INT
Step 2 • Play back a pulse & bar (CTDM) signal on alignment tape CR5-1B PS. • Set the setup menu Item 907 to 1. • CONFI sw: ON • Push FIELD SELECT 1 + 3 on the WFM (For CH-A) • Push FIELD SELECT 2 + 4 on the WFM (For CH-B) • After adjustment is completed, set the setup menu Item 907 to 0 and CONFI switch to OFF.	TP402/DM-56P(E-6) $A = +3 \pm {}^{2}_{1}$ % Higher pulse is assumed to be pulse-signed.	CH-A: ⊘RV1/DM-56P(B-7) CH-B: ⊘RV6/DM-56P(C-7) TRIG: INT

• After this adjustment is completed, readjust Section 12-6-9.

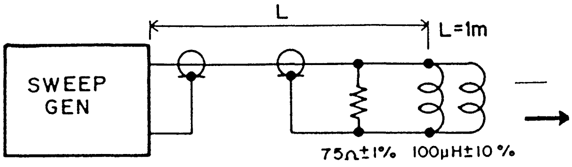
12-6-11. Y FF Level Adjustment

machine conditions for adjustment	specifications	adjustments
• Play back a 100% color-bars signal on alignment tape CR5-1B PS. • MODE: ×15 SEARCH	TP401/DM-56P(E-6)  A = 1.5 ± 0.04 Vp-p	⊘RV303/DM-56P(E-4) TRIG: TP401/DM-56P(E-6)

12-6-12. C RF Phase Equalizer Adjustment

- Head coupling tool

To make this adjustment, stop the head drum rotation without a cassette tape and L-couple the sweep signal with the video head using two inductors (approx. 100 μH × 2).

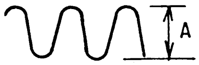
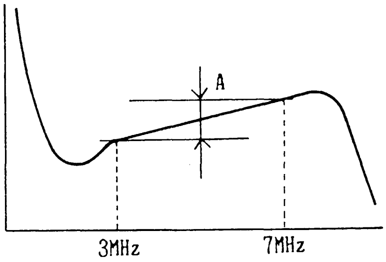


→ Put the inductors near the video head.

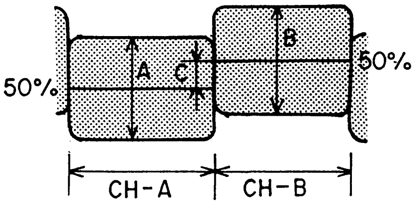
Sweep signal range: 1 to 20 MHz

- Network Analyzer

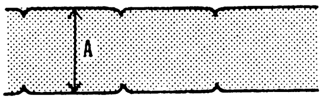
MAG	0.5 dB
DLY	10 nsec
CF	5 MHz
SPAN	10 MHz
ST	4.0 sec
IRG	0 dB
RBW	10 kHz
VBW	10 kHz
DR	1 μsec

machine conditions for adjustment	specifications	adjustments
- Adjust OUTPUT LEVEL of the network analyzer. TP505/DM-56P(H-4)  A = 0.6 ± 0.1 Vp-p (6 MHz through 8 MHz portion) - Connect the network analyzer via on oscilloscope to TP604/DM-56P, and adjust the group delay. - Close the head coupling tool in the R/P C A channel head. - MODE: EE - Repeatedly turn the power on and off until the waveform appears.	TP604/DM-56P(H-1)  A = 10 ± 10 nsec (Delay difference between 3MHz and 7MHz.)	⊘RV1/DUS-269 on the DM-56P(G-2)

12-6-13. C RF COS. Equalizer Input Level Adjustment

machine conditions for adjustment	specifications	adjustments
Step 1 • Play back a flat field signal on alignment tape CR5-1B PS. • Turn the TRACKING control so that the output waveform level is maximized.	TP505/DM-56P(H-4)  Measured in the V center. A = B = 0.6 ± 0.05 Vp-p C = 0 ± 0.04 Vdc	CH-A: ⊘RV502/DM-56P(G-5) CH-B: ⊘RV505/DM-56P(H-5) DC LEVEL: ⊘RV503/DM-56P(G-5) TRIG(-): TP902/DM-56P(F-1)
Step 2 • CONFI sw: ON • Set the setup menu Item 907 to 1. • After adjustment is completed, set the setup menu Item 907 to 0 and CONFI switch to OFF.	A = B = 0.6 ± 0.05 Vp-p	CH-A: ⊘RV501/DM-56P(G-6) CH-B: ⊘RV504/DM-56P(H-6) TRIG(-): TP902/DM-56P(F-1)

12-6-14. C RF AGC Output Level Adjustment

machine conditions for adjustment	specifications	adjustments
• Play back a flat field signal on alignment tape CR5-1B PS. • Turn the TRACKING control so that the output waveform level is maximized.	TP508/DM-56P(F-1)  Measured in the V center. A = 1.0 ± 0.04 Vp-p	⊘RV512/DM-56P(F-1) TRIG: TP902/DM-56P(F-1)

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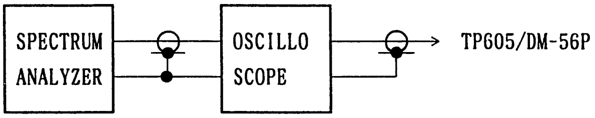
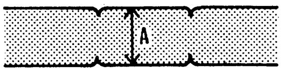
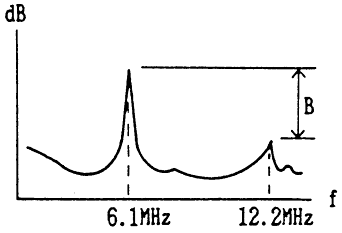
12-6-15. C HF Input Level and Balance Adjustments

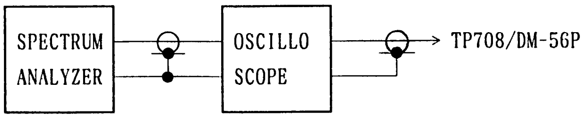
【Connection】 (Step 2)

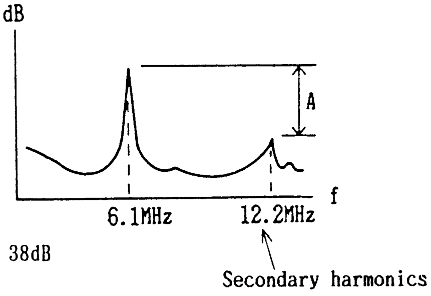
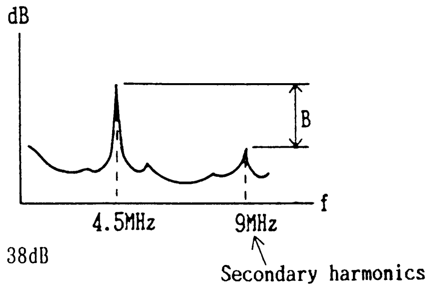


machine conditions for adjustment	specifications	adjustments
Step 1 • Play back a pulse & bar signal on alignment tape CR5-2A PS.	TP604/DM-56P(H-1)  Measured in the V center. A = 300 ± 20 mVp-p	⊘RV606/DM-56P(G-1) TRIG: TP902/DM-56P(F-1)
Step 2 • Play back a flat field signal on alignment tape CR5-1B PS. • Connect the spectrum analyzer via oscilloscope to TP605 on the DM-56P board.	TP605/DM-56P(J-1)  Maximize B level. B ≧ 40 dB	⊘RV605/DM-56P(H-1)

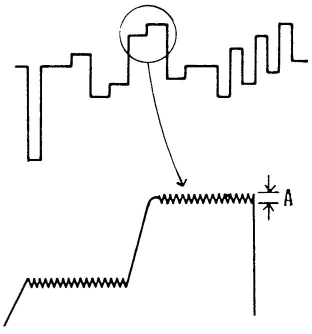
12-6-16. C Limiter Balance Adjustment

【Connection】



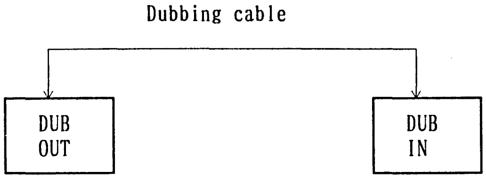
machine conditions for adjustment	specifications	adjustments
Step 1 • INPUT SELECT sw: Y-R, B • PB • PB/EE sw: PB/EE • Supply a 50/50/50 flat field signal to the COMPONENT 2 IN connector. • MODE: EE • Connect the spectrum analyzer via oscilloscope to TP708 on the DM-56P board.	TP708/DM-56P(H-2) (METAL)  A ≧ 38dB	⊘RV701/DM-56P(G-1)
Step 2 • Insert the BCT-20G cassette tape. • MODE: EE	(OXIDE)  B ≧ 38dB	

12-6-17. C Demodulator Balance Adjustment

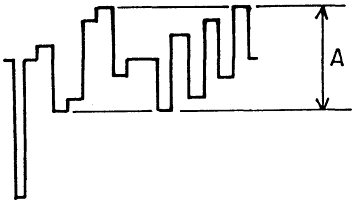
machine conditions for adjustment	specifications	adjustments
• INPUT SELECT sw: Y-R, B • PB • PB/EE sw: PB/EE • Supply a color-bars signal to the COMPONENT 2 IN connector. • MODE: STOP • Insert the BCT-20G cassette tape.	TP801/DM-56P(J-6)  Minimize the carrier leak. A ≦ 30 mVp-p Measurement should be made in the noise peak level.	⊘RV702/DM-56P(J-1) TRIG: TP801/DM-56P(J-6)

12-6-18. C DUB OUT Level Adjustment

【Connection】

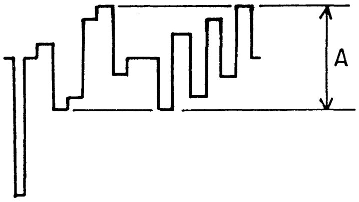


VTR to be adjusted.

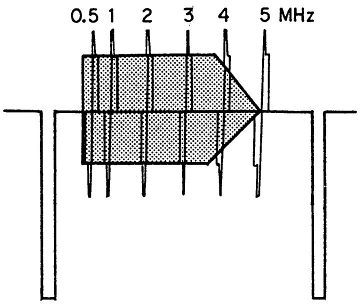
machine conditions for adjustment	specifications	adjustments
Step 1 • Connect DUB OUT and DUB IN connectors using a dubbing cable. • Play back a 100% color-bars signal on alignment tape CR5-1B PS.	TP804/DM-56P(J-6)  A = 0.78 ± 0.01 Vp-p	⊘RV703/DM-56P(J-3) TRIG: TP804/DM-56P(J-6)
Step 2 • Play back a color-bars signal on alignment tape CR5-2A PS. • After adjustment is completed, remove the dubbing cable.	A = 0.59 ± 0.01 Vp-p	⊘RV704/DM-56P(J-3) TRIG: TP804/DM-56P(J-6)

12-6-19. C Demodulator Output Level Adjustment

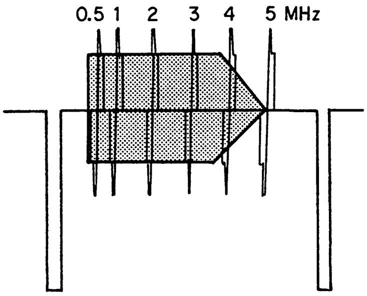
• Before perform this adjustment, the C DUB OUT Level Adjustment (Section 12-6-18) should be completed.

machine conditions for adjustment	specifications	adjustments
• Play back a 100% color-bars signal on alignment tape CR5-1B PS.	TP802/DM-56P(H-5)  A = 0.93 ± 0.01 Vp-p	⊘RV802/DM-56P(J-6) TRIG: TP802/DM-56P(H-5)

12-6-20. C Video Frequency Response Adjustment

<table>
<tr><th>machine conditions for adjustment</th><th>specifications</th><th>adjustments</th></tr>
<tr>
<td>Step 1
• Play back a 60% H. sweep (CTDM) signal on alignment tape CR5-1B PS.
• Push FIELD SELECT 1 + 3 on the WFM (For CH-A).
• Push FIELD SELECT 2 + 4 on the WFM (For CH-B).</td>
<td>TP801/DM-56P(J-6)

Observe the level of the waveform in the moire center.
<table>
<tr><th>Freq.</th><th>Level</th></tr>
<tr><td>0. 5MHz</td><td>100 % (Ref.)</td></tr>
<tr><td>1. 0MHz</td><td>100 ± 4 %</td></tr>
<tr><td>2. 0MHz</td><td>100 ± 4 %</td></tr>
<tr><td>3. 0MHz</td><td>98 ± 4 %</td></tr>
<tr><td>4. 0MHz</td><td>75% or more</td></tr>
</table>
</td>
<td>CH-A:
⊘RV1/EQ-28/DM-56P(H-4)
CH-B:
⊘RV2/EQ-28/DM-56P(H-4)

TRIG: TP401/DM-56P(E-6)</td>
</tr>
<tr>
<td>Step 2
• Set the setup menu Item 907 to 1.
• CONFI sw: ON
• Push FIELD SELECT 1 + 3 on the WFM (For CH-A).
• Push FIELD SELECT 2 + 4 on the WFM (For CH-B).

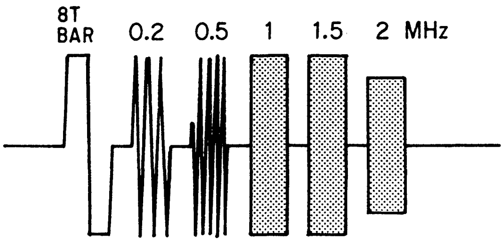
• After adjustment is completed, set the setup menu Item 907 to 0 and CONFI switch to OFF.</td>
<td>TP801/DM-56P(J-6)

Observe the level of the waveform in the moire center.
<table>
<tr><th>Freq.</th><th>Level</th></tr>
<tr><td>0. 5MHz</td><td>100 % (Ref.)</td></tr>
<tr><td>1. 0MHz</td><td>100 ± 4 %</td></tr>
<tr><td>2. 0MHz</td><td>100 ± 4 %</td></tr>
<tr><td>3. 0MHz</td><td>98 ± 4 %</td></tr>
<tr><td>4. 0MHz</td><td>75% or more</td></tr>
</table>
</td>
<td>CH-A:
⊘RV3/EQ-28/DM-56P(G-4)
CH-B:
⊘RV4/EQ-28/DM-56P(G-3)

TRIG: TP401/DM-56P(E-6)</td>
</tr>
</table>

Step 3

- Play back a multi burst signal on alignment tape CR5-1B PS.

COMPONENT 2 R-Y OUT



Observe the level of the waveform in the moire center.

Freq.	Level
8T bar	100 % (Ref.)
0.2MHz	100 ± 4 %
0.5MHz	100 ± 4 %
1.0MHz	100 ± 4 %
1.5MHz	98 ± 5 %
2.0MHz	75% or more

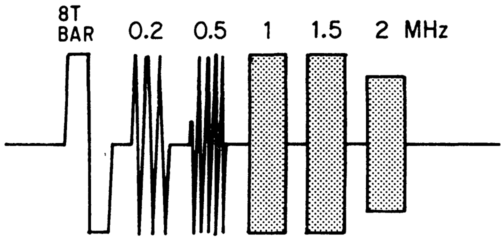
⊘CV103/TBC-12P(B-2)

TRIG: COMPONENT 2 Y OUT

Step 4

- Play back a multi burst signal on alignment tape CR5-1B PS.

COMPONENT 2 B-Y OUT



Observe the level of the waveform in the moire center.

Freq.	Level
8T bar	100 % (Ref.)
0.2MHz	100 ± 4 %
0.5MHz	100 ± 4 %
1.0MHz	100 ± 4 %
1.5MHz	98 ± 5 %
2.0MHz	75% or more

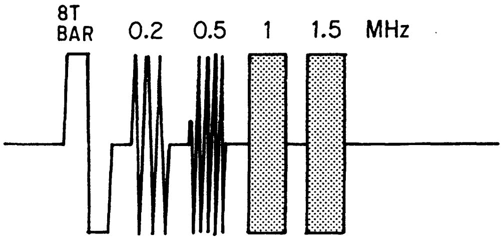
⊘CV102/TBC-12P(A-2)

TRIG: COMPONENT 2 Y OUT

Step 5

- Play back a multi burst signal on alignment tape CR5-2A PS.
- Push FIELD SELECT 1 + 3 on the WFM (For CH-A).
- Push FIELD SELECT 2 + 4 on the WFM (For CH-B).

COMPONENT 2 R-Y OUT



Observe the level of the waveform in the moire center.

Freq.	Level
8T bar	100 % (Ref.)
0.2MHz	100 ± 4 %
0.5MHz	100 ± 4 %
1.0MHz	90 ± 5 %
1.5MHz	70% or more

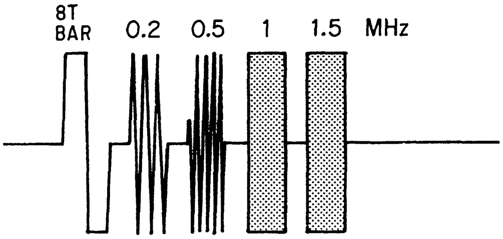
CH-A:
⊘RV5/EQ-28/DM-56P(H-4)
CH-B:
⊘RV6/EQ-28/DM-56P(G-4)

TRIG: COMPONENT 2 Y OUT

Step 6

- Set the setup menu Item 907 to 1.
- CONFI sw: ON
- Play back a multi burst signal on alignment tape CR5-2A PS.
- Push FIELD SELECT 1 + 3 on the WFM (For CH-A).
- Push FIELD SELECT 2 + 4 on the WFM (For CH-B).
- After adjustment is completed, set the setup menu Item 907 to 0 and CONFI switch to OFF.

COMPONENT 2 R-Y OUT



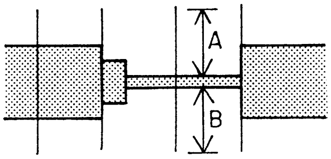
Observe the level of the waveform in the moire center.

Freq.	Level
8T bar	100 % (Ref.)
0.2MHz	100 ± 4 %
0.5MHz	100 ± 4 %
1.0MHz	90 ± 5 %
1.5MHz	70% or more

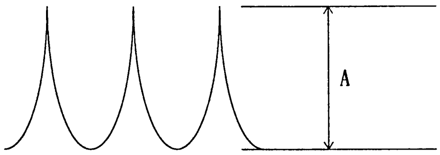
CH-A:
⊘RV7/EQ-28/DM-56P(G-4)
CH-B:
⊘RV8/EQ-28/DM-56P(G-4)

TRIG: COMPONENT 2 Y OUT

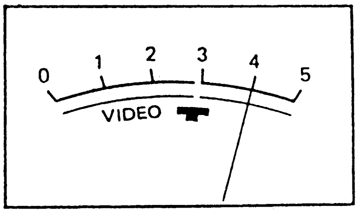
12-6-21. Y Noise Canceller Adjustment

machine conditions for adjustment	specifications	adjustments
• INPUT SELECT sw: Y-R, B • Supply a pulse & bar signal to the COMPONENT 2 IN connector. • MODE: STOP • Insert a BCT-20G cassette.	TP405/DM-56P(E-6)  A = B ± 20 mV	⊘RV405/DM-56P(F-6) TRIG: INT

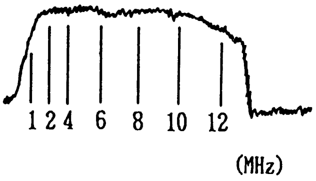
12-6-22. Y RF Envelope Adjustment

machine conditions for adjustment	specifications	adjustments
• Play back a flat field signal on alignment tape CR5-1B PS. • Put the unit into the SEARCH STILL mode. • Put the unit into JOG mode, and turn search dial so that the output waveform is maximized.	TP206/DM-56P(C-4)  A = 0.6 ± 0.1 Vp-p	⊘RV207/DM-56P(C-3) TRIG: INT

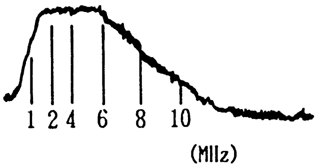
12-6-23. RF Meter Adjustment

machine conditions for adjustment	specifications	adjustments
• Play back a flat field signal on alignment tape CR5-1B PS. • Maximize the deflection of the RF meter pointer using a TRACKING control.	VIDEO RF meter/front panel  Set the pointer to 4.	⊘RV206/DM-56P(A-6)

12-6-24. Y DOC Sensitivity Adjustment

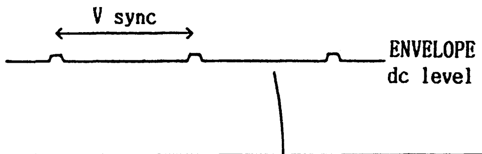
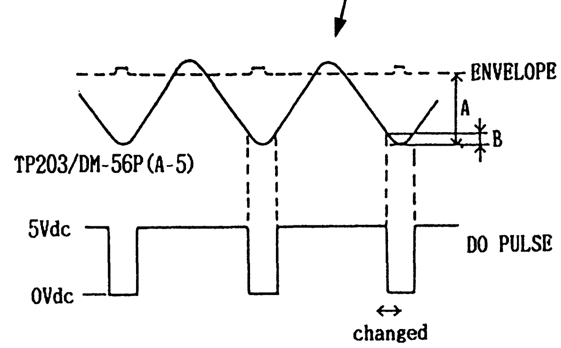
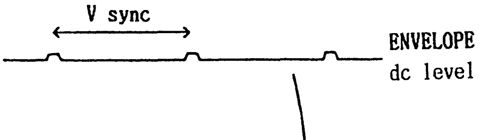
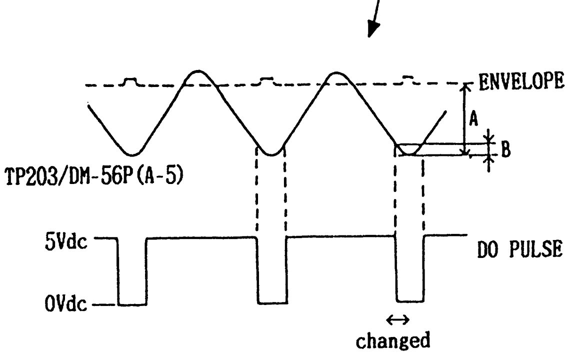
<table>
<tr><th>machine conditions for adjustment</th><th>specifications</th><th>adjustments</th></tr>
<tr>
<td>
Step 1
• Set the setup menu Item 907 to 1.
• Play back a RF sweep signal on alignment tape CR5-1B PS.
• S1/SV-83A: ON
• S101-Bit4/SV-82: ON
• Turn the TRACKING control so that the output waveform around 6 through 7 MHz is maximized.
• CONFI sw: OFF (Spec. A)
• CONFI sw: ON (Spec. B)
• Adjust so that the specification is satisfied when the trigger of the oscilloscope is set to the negative side and the positive side.
• After adjustment is completed, set the setup menu Item 907 to 0 and the above switches to former position.
</td>
<td>
TP202/DM-56P(A-4)
(METAL)


CH-A/CH-B
<table>
<tr><th></th><th colspan="2">LEVEL</th></tr>
<tr><th>Freq.</th><th>Spec. A</th><th>Spec. B</th></tr>
<tr><td>2 MHz</td><td>100 ± $^{10}_{20}$ %</td><td>100 ± $^{15}_{20}$ %</td></tr>
<tr><td>4 MHz</td><td>100 ± $^{10}_{15}$ %</td><td>100 ± 15 %</td></tr>
<tr><td>8 MHz</td><td>100 % (Ref.)</td><td>100 % (Ref.)</td></tr>
<tr><td>10 MHz</td><td>100 ± $^{15}_{5}$ %</td><td>100 ± $^{20}_{5}$ %</td></tr>
<tr><td>12 MHz</td><td>80 ± 20 %</td><td>60 ± 25 %</td></tr>
</table>
</td>
<td>
RV201/DM-56P(A-3)
(Low range)
RV202/DM-56P(A-3)
(High range)

TRIG: TP901/DM-56P(C-1)
(-): CH-A
(+): CH-B
</td>
</tr>
<tr>
<td>
Step 2
• Close the OXIDE/METAL tape detection hole on the back side of the CR5-1B PS alignment tape with tape and play back the RF sweep signal.
• Adjust so that the specification is satisfied when the trigger of the oscilloscope is set to the negative side and the positive side.
• After adjustment is completed, remove the tape on the back side of the CR5-1B PS alignment tape.
</td>
<td>
(OXIDE)


<table>
<tr><th>Freq.</th><th>LEVEL</th></tr>
<tr><td>2 MHz</td><td>——</td></tr>
<tr><td>4 MHz</td><td>90 ± $^{15}_{10}$ %</td></tr>
<tr><td>6 MHz</td><td>100% (Ref.)</td></tr>
<tr><td>8 MHz</td><td>100 ± $^{20}_{25}$ %</td></tr>
<tr><td>10 MHz</td><td>70 ± $^{25}_{10}$ %</td></tr>
</table>
</td>
<td>
CV1/DUS-288 on the DM-56P board.

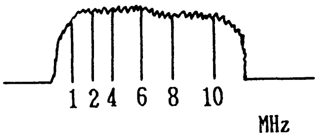
TRIG: TP901/DM-56P(C-1)
(-): CH-A
(+): CH-B
</td>
</tr>
</table>

Step 3 • Play back a pulse & bar signal on alignment tape CR5-2A PS.	TP202/DM-56P(A-4)  V sync ENVELOPE dc level	Maximize the DC level using a TRACKING control.
Step 4 • PB. PB/EE sw: PB/EE • MODE: JOG STILL	TP202/DM-56P(A-4)  ENVELOPE A B TP203/DM-56P(A-5) 5Vdc 0Vdc DO PULSE ↔ changed B/A = 20 ± 2 %	⊘RV203/DM-56P(A-4) TRIG: TP404/DM-56P(B-6)
Step 5 • Play back a flat field signal on alignment tape CR5-1B PS.	TP202/DM-56P(A-4)  V sync ENVELOPE dc level	Maximize the DC level using a TRACKING control.
Step 6 • PB. PB/EE sw: PB/EE • MODE: JOG STILL	TP202/DM-56P(A-4)  ENVELOPE A B TP203/DM-56P(A-5) 5Vdc 0Vdc DO PULSE ↔ changed B/A = 16 ± 2 %	⊘RV204/DM-56P(B-5) TRIG: TP404/DM-56P(B-6)

Step 7 • Check that no white noise appears near the guard band on a monitor.		
Step 8 • Play back a 100% color-bars with dropout signal on alignment tape CR5-1B PS.	Check that the dropout portion is compensated on the monitor.	
Step 9 • Play back a color-bars signal on alignment tape CR5-2A PS. • MODE: FWD ×24.	If the play back picture cannot recognize with color-bars signal, perform adjustment so that recognize with the color-bars signal.	⊘RV205/DM-56P(A-5)

12-6-25. C DOC Sensitivity Adjustment

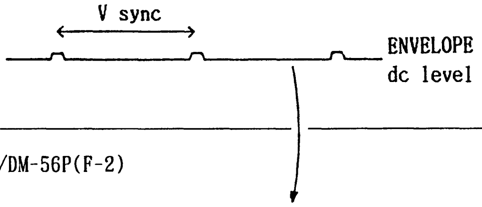
<table>
<tr><th>machine conditions for adjustment</th><th>specifications</th><th>adjustments</th></tr>
<tr>
<td>Step 1
• Set the setup menu Item 907 to 1.
• Play back a RF sweep signal on alignment tape CR5-1B PS.
• S1/SV-83A: ON
• S101-Bit4/SV-82: ON
• Turn the TRACKING control so that the output waveform is maximized.
• CONFI sw: OFF
(Spec. A)
• CONFI sw: ON
(Spec. B)
• Adjust so that the specification is satisfied when the trigger of the oscilloscope is set the negative side and the positive side.
• After adjustment is completed, set the setup menu Item 907 to 0 and the above switches to former position.</td>
<td>TP602/DM-56P(F-3)



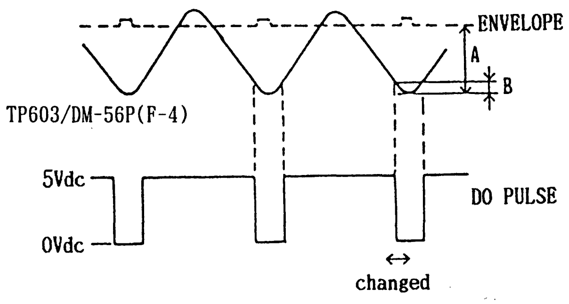
CH-A/CH-B

<table>
<tr><th></th><th colspan="2">Level</th></tr>
<tr><th>Freq.</th><th>Spec. A</th><th>Spec. B</th></tr>
<tr><td>2 MHz</td><td>80 ± 20 %</td><td>80 ± 20 %</td></tr>
<tr><td>4 MHz</td><td>100 ± 10 %</td><td>100 ± 10 %</td></tr>
<tr><td>6 MHz</td><td>100 % (Ref.)</td><td>100 % (Ref.)</td></tr>
<tr><td>8 MHz</td><td>100 ± 20 %</td><td>95 ± 20 %</td></tr>
<tr><td>10 MHz</td><td>75 ± 20 %</td><td>75 ± 25 %</td></tr>
</table>
</td>
<td>⊘RV601/DM-56P(F-2)
(Low range)
⊘RV602/DM-56P(F-2)
(High range)

TRIG: TP901/DM-56P(C-1)
(-): CH-A
(+): CH-B</td>
</tr>
<tr>
<td>Step 2
• Play back a pulse & bar signal on alignment tape CR5-2A PS.</td>
<td>TP602/DM-56P(F-3)

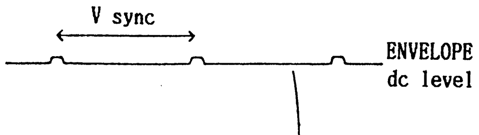
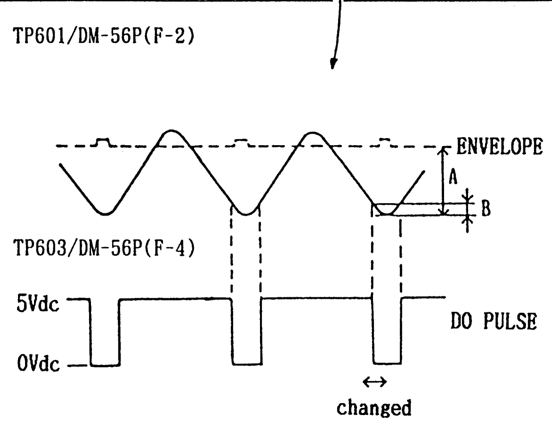


</td>
<td>Maximize the DC level using a TRACKING control.</td>
</tr>
<tr>
<td>Step 3
• PB. PB/EE sw: PB/EE
• MODE: JOG STILL</td>
<td>TP601/DM-56P(F-2)



B/A = 20 ± 2 %
(B/A indicates the DO pulse detection level in the JOG STILL mode relative to the DC level at TP601 in the normal PB mode.)
</td>
<td>⊘RV603/DM-56P(F-3)

TRIG: TP902/DM-56P(F-1)</td>
</tr>
</table>

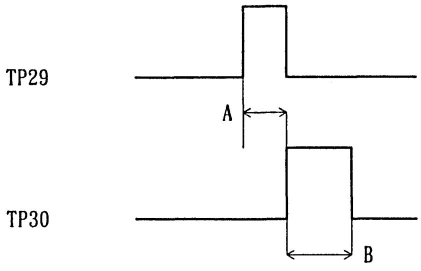
Step 4 • Play back a flat field signal on alignment tape CR5-1B PS.	TP602/DM-56P(F-3) 	Maximize the DC level using a TRACKING control.
Step 5 • PB. PB/EE sw: PB/EE • MODE: JOG STILL	TP601/DM-56P(F-2)  ENVELOPE A B TP603/DM-56P(F-4) 5Vdc DO PULSE 0Vdc changed B/A = 16 ± 2 % (B/A indicates the DO pulse detection level in the JOG STILL mode relative to the DC level at TP601 in the normal PB mode.)	⊘RV604/DM-56P(G-3)
Step 6 • Check that no white noise appears near the guard band on a monitor.		
Step 7 • Play back a 100% color-bars with dropout signal on alignment tape CR5-1B PS.	Check that the dropout portion is compensated on the monitor.	

12-6-26. REV×24 Over Modulation Adjustment

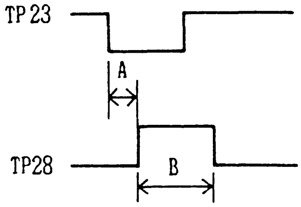
machine conditions for adjustment	specifications	adjustments
• Play back a color-bars signal on alignment tapes CR5-1B PS and CR5-2A PS. • MODE: REV×24	If the play back picture cannot recognize with color-bars signal, perform adjustment so that recognize with the color-bars signal.	⊘LV1/DM-56P(C-5)

12-7. EN-48P BOARD ADJUSTMENT

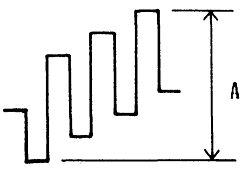
12-7-1. Clamp Pulse Position Adjustment

machine conditions for adjustment	specifications	adjustments
• INPUT SELECT sw: Y-R, B • Supply a 100% color-bars signal to the COMPONENT 2 IN connector. • MODE: EE	TP29/EN-48P(C-1) TP30/EN-48P(D-1)  A = 0.8 ± 0.1 μsec B = 1.0 ± 0.1 μsec	⊘RV21/EN-48P(D-2) ⊘RV22/EN-48P(D-1)

12-7-2. Burst Gate Pulse Tentative Adjustment

machine conditions for adjustment	specifications	adjustments
• INPUT SELECT sw: Y-R, B • Supply a 100% color-bars signal to the COMPONENT 2 IN connector. • MODE: EE	TP23/EN-48P(C-2) TP28/EN-48P(C-1)  A = 0.43 ± 0.01 μsec B = 3.25 ± 0.05 μsec	• Position ⊘RV27/EN-48P(D-2) • Width ⊘RV28/EN-48P(D-2) TRIG: REF. VIDEO OUT/ connector panel

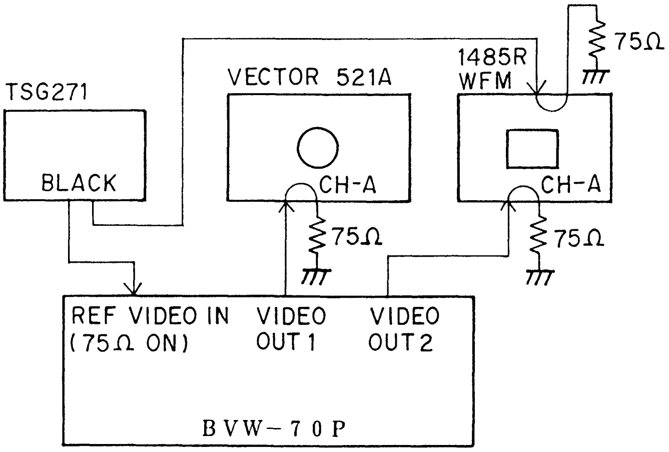
12-7-3. Chroma Input Level Adjustment

machine conditions for adjustment	specifications	adjustments
• Play back a 100% color-bars signal on alignment tape CR5-1B PS.	TP3/EN-48P(D-5) (B-Y)  A = 0.575 ± 0.02 Vp-p	⊘RV1/EN-48P(C-5) TRIG: TP3/EN-48P(D-5)

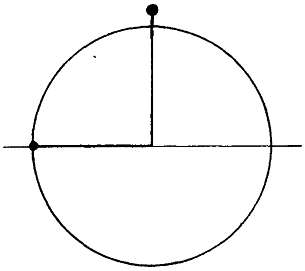
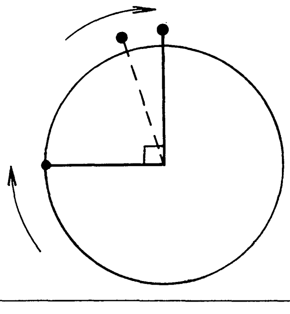
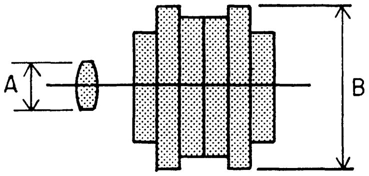
* After this adjustment is completed, make Sections 12-7-9 Component 2 R-Y/B-Y Level Adjustment and 12-7-10 DUB C OUT Level Adjustment.

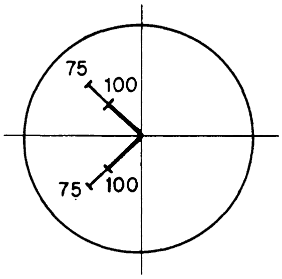
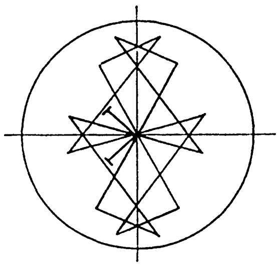
12-7-4. COMPOSITE C OUT Level Adjustment

【Connection】


TSG271
BLACK
VECTOR 521A
CH-A
1485R
WFM
CH-A
75Ω
75Ω
75Ω
REF VIDEO IN
(75Ω ON)
VIDEO
OUT 1
VIDEO
OUT 2
BVW-70P

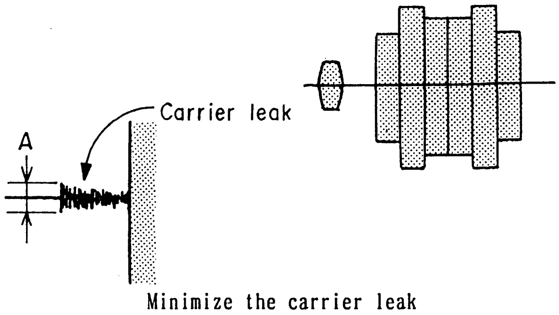
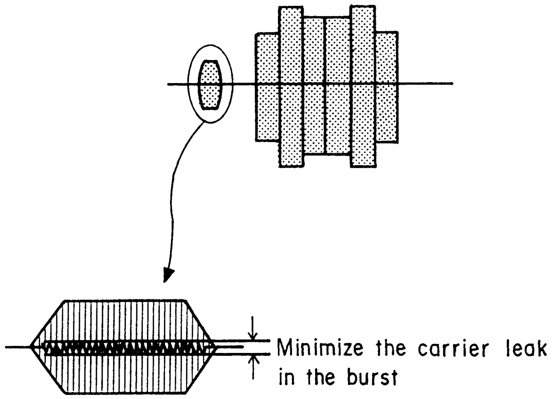
- Before perform this adjustment, perform Sec. 12-8-7.

machine conditions for adjustment	specifications	adjustments
Step 1 • Play back a 100% color-bars signal on alignment tape CR5-1B PS. • S2/VO-18P(A-4): ON • RV350/EN-48P(B-2): mechanical center	VIDEO OUT 1 (Terminated in 75 ohms.)  • Adjust the burst phase using the vector monitor's PHASE control and GAIN control.	PHASE control/vector scope GAIN control/vector scope
Step 2	VIDEO OUT 1 (Terminated in 75 ohms.) 	RV501-EN-48P(B-3)
Step 3	VIDEO OUT 2 (Terminated in 75 ohms.)  A = 300 ± 5 mVp-p B = 885 ± 5 mVp-p	• For A RV7/EN-48P(B-4) • For B RV4/EN-48P(A-4)

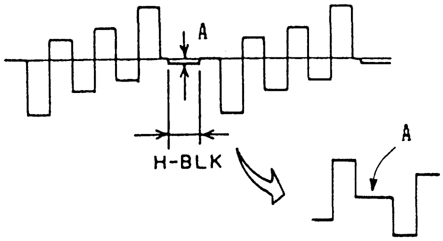
Step 4	VIDEO OUT 1 (Terminated in 75 ohms) (Vectorscope)  • Adjustment the burst phase using the vector monitor' PHASE control.	
Step 5	VIDEO OUT 1 (Terminated in 75 ohms) (Vectorscope)  Adjust each dot to the center of ⊞ .	⊘RV203/EN-48P(A-2) ⊘RV4/EN-48P(A-4) ⊘RV14/EN-48P(E-4) • Adjustment direction : RV4 : RV203 : RV14

• After this adjustment is completed, make Sec. 12-8-8.

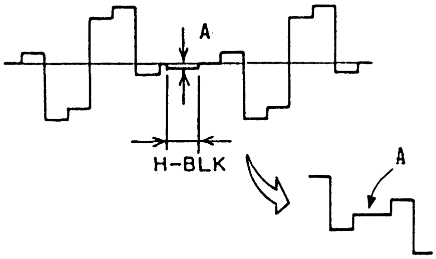
12-7-5. Carrier Leak Adjustment

machine conditions for adjustment	specifications	adjustments
Step 1 • INPUT SELECT sw: Y-R, B • Supply a 100% color-bars signal to the COMPONENT 2 IN connector. • S2/VO-18P(A-4): ON	VIDEO OUT 2 (WFM)  Minimize the carrier leak (A ≦ 20 mVp-p)	⊘RV6/EN-48P(A-5) ⊘RV2/EN-48P(A-5) TRIG: INT
Step 2 • After adjustment is completed, set S2 on the VO-18P board to OFF.	VIDEO OUT 2 (WFM)  Minimize the carrier leak in the burst	⊘RV502/EN-48P(A-3) ⊘RV602/EN-48P(A-3) TRIG: INT

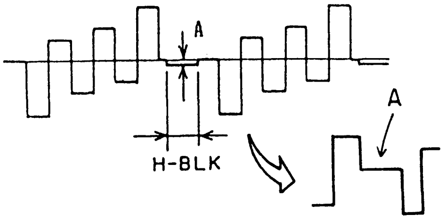
12-7-6. COMPONENT 2 B-Y Blanking Level Adjustment

machine conditions for adjustment	specifications	adjustments
• Play back a 100% color-bars signal on alignment tape CR5-1B PS. • For this adjustment, never extend the EN-48P board using an extension board.	COMPONENT 2, B-Y OUT  Minimize the blanking level in portion A. (No level difference)	⊘RV30/EN-48P(A-4) TRIG: REF. VIDEO OUT/ connector panel

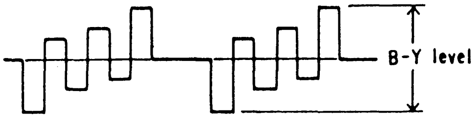
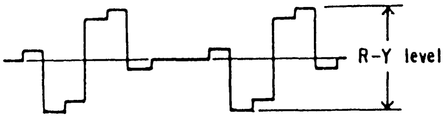
12-7-7. COMPONENT 2 R-Y Blanking Level Adjustment

machine conditions for adjustment	specifications	adjustments
• Play back a 100% color-bars signal on alignment tape CR5-1B PS. • For this adjustment, never extend the EN-48P board using an extension board.	COMPONENT 2, R-Y OUT  Minimize the blanking level in portion A. (No level difference)	⊘RV40/EN-48P(A-4) TRIG: REF.VIDEO OUT/ connector panel

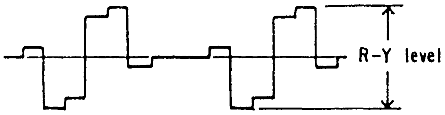
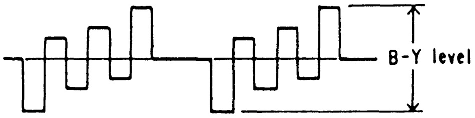
12-7-8. DUB B-Y Blanking Level Adjustment

machine conditions for adjustment	specifications	adjustments
• Play back a 100% color-bars signal on alignment tape CR5-1B PS. • For this adjustment, never extend the EN-48P board using an extension board.	DUB/COMPONENT 1 B-Y OUT, pin 5  Minimize the blanking level in portion A. (No level difference)	⊘RV31/EN-48P(A-4) TRIG: REF.VIDEO OUT/ connector panel

12-7-9. COMPONENT 2 R-Y/B-Y OUT Level Adjustment

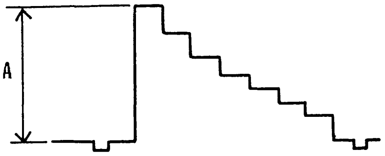
machine conditions for adjustment	specifications	adjustments
• Play back a 100% color-bars signal on alignment tape CR5-1B PS.	COMPONENT 2 B-Y OUT (Terminated in 75 ohms.)  B-Y level = 0.7 ± 0.01 Vp-p	⊘RV34/EN-48P(F-5)
	COMPONENT 2 R-Y OUT (Terminated in 75 ohms.)  R-Y level = 0.7 ± 0.01 Vp-p	⊘RV41/EN-48P(F-5) TRIG: REF.VIDEO OUT/ connector panel

12-7-10. DUB C OUT Level Adjustment

machine conditions for adjustment	specifications	adjustments
• Play back a 100% color-bars signal on alignment tape CR5-1B PS.	DUB/COMPONENT 1 R-Y OUT, pin 3 (Terminated in 75 ohms.)  R-Y level = 0.7 ± 0.01 Vp-p	⊘RV42/EN-48P(F-5)
	DUB/COMPONENT 1 B-Y OUT, pin 5 (Terminated in 75 ohms.)  B-Y level = 0.7 ± 0.01 Vp-p	⊘RV33/EN-48P(F-4) TRIG: REF.VIDEO OUT/ connector panel

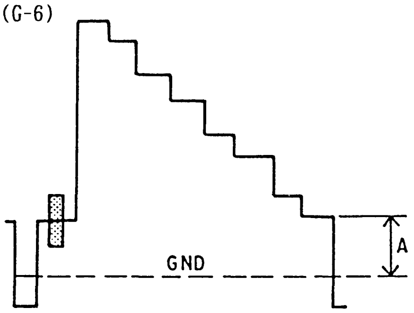
12-8. VO-18P BOARD ADJUSTMENT

12-8-1. Input Level Adjustment

machine conditions for adjustment	specifications	adjustments
• Play back a 100% color-bars signal on alignment tape CR5-1B PS.	TP2/VO-18P(C-6)  Level difference between the pedestal level is not contained. A = 1.0 ± 0.02 Vp-p	⊘RV1/VO-18P(B-7) TRIG: TP2/VO-18P(C-6)

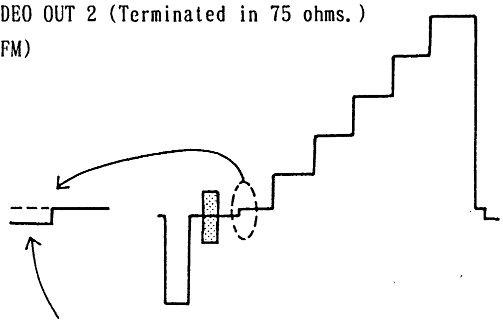
* After this adjustment is completed, adjust Sections 12-8-6 Character Adjustment and 12-8-7 Video output level adjustment.

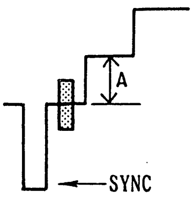
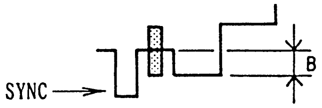
12-8-2. Y DC Level Adjustment

machine conditions for adjustment	specifications	adjustments
• INPUT SELECT sw: Y-R, B • Supply a 100% color-bars signal to the COMPONENT 2 IN connector. • MODE: EE • S1/EN-48P: ON • After adjustment is completed, set S1 to the former position.	TP6/VO-18P(G-6)  A = 0 ± 0.01 Vdc.	⊘RV7/VO-18P(F-6) TRIG: TP6/VO-18P(G-6)

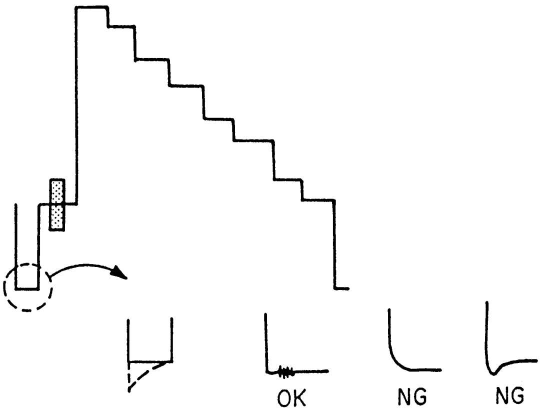
* After this adjustment is completed, make Section 12-8-8 Character Pedestal Adjustment.

12-8-3. Black Level Adjustment

machine conditions for adjustment	specifications	adjustments
Step 1 • INPUT SELECT sw: Y-R, B • Supply a 5-step signal to the COMPONENT 2 IN connector. • S1/EN-48P: ON • MODE: EE • Fully turn RV501 on the VO-18P to counterclockwise.	VIDEO OUT 2 (Terminated in 75 ohms.) (WFM)  No level difference should appear.	⊘RV2/VO-18P(A-5) TRIG: REF. VIDEO OUT/ connector panel

Step 2 • BLACK LEVEL PRESET/MANUAL sw: MANUAL • Fully turn the BLACK LEVEL control to clockwise.	VIDEO OUT 2 (Terminated in 75 ohms.)  A = 100 $\pm^{5}_{0}$ mV	⊘RV4/VO-18P(B-6)
Step 3 • Fully turn the BLACK LEVEL control to counterclockwise. • After adjustment is completed, return the above switches to former ponsition.	VIDEO OUT 2 (Terminated in 75 ohms.)  B = -80 ± 10 mV	⊘RV501/VO-18P(C-5) TRIG: REF. VIDEO OUT/ connector panel

12-8-4. Composite Sync Waveform Shaping Adjustment

machine conditions for adjustment	specifications	adjustments
• INPUT SELECT sw: Y-R, B • Supply a 100% color-bars signal to the COMPONENT 2 IN connector. • S1/EN-48P: ON • MODE: EE • After adjustment is completed, set S1 on the EN-48P board to the former position.	VIDEO OUT 2 (Terminated in 75 ohms.) (WFM)  Adjust to be most rectangular.	⊘LV2/VO-18P(F-5) TRIG: INT

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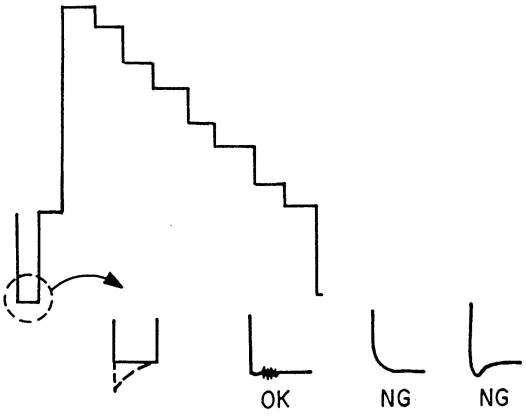
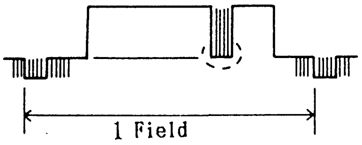
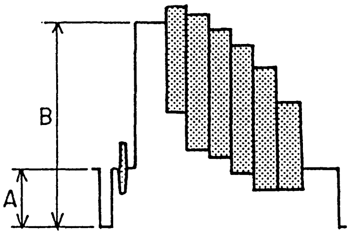
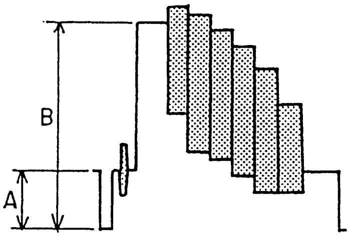
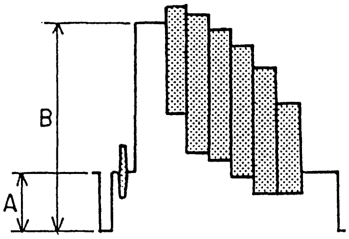
12-8-5. Component Sync Waveform Shaping Adjustment

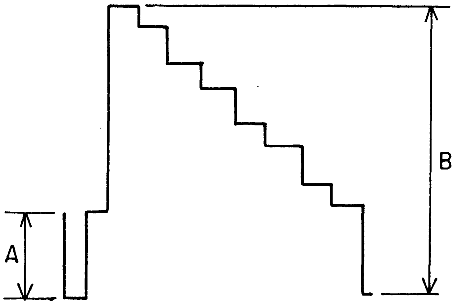
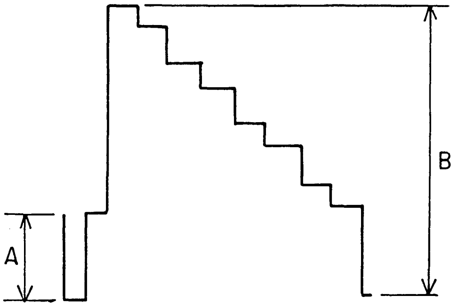
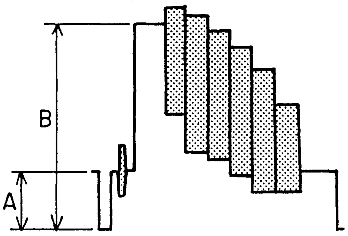
machine conditions for adjustment	specifications	adjustments
• INPUT SELECT sw: Y-R, B • Supply a 100% color-bars signal to the COMPONENT 2 IN connector. • S1/EN-48P: ON • MODE: EE • After adjustment is completed, set S1 on the EN-48P board to the former position.	COMPONENT 2 Y OUT (Terminated in 75 ohms.) (WFM)  Adjust to be most rectangular.	⊘LV1/VO-18P(E-4) TRIG: INT

12-8-6. Character Pedestal Adjustment

machine conditions for adjustment	specifications	adjustments
• CHARACTER sw/SY-64P: ON • Play back a 100% color-bars signal on alignment tape CR5-1B PS. • S1/EN-48P: ON • S1/VO-18P: B Black • BLACK LEVEL PRESET/MANUAL sw: PRESET • After adjustment is completed, set S1 on the EN-48P and VO-18P boards to the former position.	VIDEO OUT 3 (Terminated in 75 ohms)  Eliminate the level difference at the pedestal portion. 0 ± 0.05 Vdc	⊘RV14/VO-18P(A-6) TRIG: INT

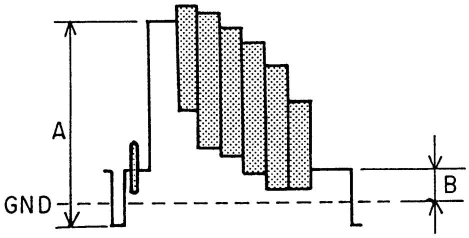
12-8-7. Video Output Level Adjustment

machine conditions for adjustment	specifications	adjustments
• Play back a 100% color-bar signal on alignment tape CR5-1B PS.	Step 1 VIDEO OUT 1 (Terminated in 75 ohms)  A (Sync Level) = 0.3 ± 0.003 Vp-p B (Y Level) = 1.00 ± 0.01 Vp-p	• Sync Level ⊘RV10/VO-18P(E-5) • Y Level ⊘RV5/VO-18P(E-5) TRIG: REF. VIDEO OUT/ connector panel
	Step 2 VIDEO OUT 2 (Terminated in 75 ohms)  A (Sync Level) = 0.3 ± 0.003 Vp-p B (Y Level) = 1.00 ± 0.01 Vp-p	• Sync Level ⊘RV16/VO-18P(F-6) • Y Level ⊘RV20/VO-18P(G-6) TRIG: REF. VIDEO OUT/ connector panel
	Step 3 VIDEO OUT 3 (Terminated in 75 ohms)  A (Sync Level) = 0.3 ± 0.003 Vp-p B (Y Level) = 1.00 ± 0.01 Vp-p	• Sync Level ⊘RV17/VO-18P(F-5) • Y Level ⊘RV13/VO-18P(G-5) TRIG: REF. VIDEO OUT/ connector panel

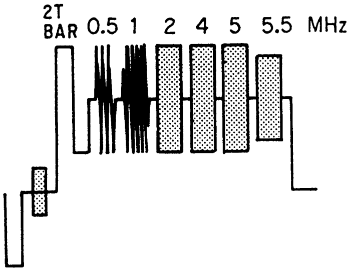
	Step 4 DUB/COMPONENT 1 OUT (Terminated in 75 ohms)  A (Sync Level) = 0.3 ± 0.003 Vp-p B (Y Level) = 1.00 ± 0.01 Vp-p	• Sync Level ⊘RV11/VO-18P(E-4) • Y Level ⊘RV702/VO-18P(C-3) TRIG: REF. VIDEO OUT/ connector panel
	Step 5 COMPONENT 2 Y OUT (Terminated in 75 ohms)  A (Sync Level) = 0.3 ± 0.003 Vp-p B (Y Level) = 1.00 ± 0.01 Vp-p	• Sync Level ⊘RV19/VO-18P(B-4) • Y Level ⊘RV9/VO-18P(A-4) TRIG: REF. VIDEO OUT/ connector panel
	Step 6 TP17/VO-18P(G-5)  A (Y Level) = 1.00 ± 0.01 Vp-p	⊘RV21/VO-18P(H-4) TRIG: REF. VIDEO OUT/ connector panel

- After this adjustment is completed, make Sec. 12-7-4.

12-8-8. TBC Bypass Adjustment

machine conditions for adjustment	specifications	adjustments
• INPUT SELECT sw: COMPOSITE • Supply a 100% color-bars signal to the VIDEO IN connector. • TBC BYPASS sw/subcontrol panel: BYPASS • MODE: EE • After adjustment is completed, set the TBC BYPASS switch to ON.	VIDEO OUT 1 (Terminated in 75 ohms.)  A (Composite video level) = 1.0 ± 0.02 Vp-p B (Set the pedestal level) = 0 ± 0.01 Vdc.	• Video Level ⊘RV22/VO-18P(E-7) • Pedestal Level ⊘RV23/VO-18P(F-6) TRIG: VIDEO OUT 1/ connector panel

12-8-9. Frequency Response Adjustment

<table>
<tr><th>machine conditions for adjustment</th><th>specifications</th><th>adjustments</th></tr>
<tr>
<td>• Play back a multi burst signal on alignment tape CR5-1B PS.
• S1/EN-48P: ON
• After adjustment is completed, set S1 on the EN-48P board to the former position.</td>
<td>VIDEO OUT 1 (Terminated in 75 ohms.)

Observe the level of the waveform in the moire center.
<table>
<tr><th>Freq.</th><th>Level</th></tr>
<tr><td>2T bar</td><td>100 %(Ref.)</td></tr>
<tr><td>0.5MHz</td><td>100 ± 4 %</td></tr>
<tr><td>1.0MHz</td><td>100 ± 4 %</td></tr>
<tr><td>2.0MHz</td><td>100 ± 4 %</td></tr>
<tr><td>4.0MHz</td><td>100 ± 4 %</td></tr>
<tr><td>5.0MHz</td><td>98 ± 4 %</td></tr>
<tr><td>5.5MHz</td><td>75% or more</td></tr>
</table>
</td>
<td>⊘CV1/VO-18P(D-5)
TRIG: VIDEO OUT 1/ connector panel</td>
</tr>
</table>

SECTION 13
TBC ALIGNMENT

【Equipment Required】

- Dual-trace oscilloscope
- PAL signal generator (Tektronix TSG-271 or the equivalent)
- Waveform vector monitor (Tektronix 1751 or the equivalent)
- Frequency counter
- Alignment tape CR5-2A PS or CR5-1B PS

CR5-2A PS (8-960-098-44) Contents

TIME min, sec	VIDEO TRACK
0:00	75% Color Bars
3:00	Multi Burst Y: 0.5, 1, 2, 3, 4.1, 4.5 MHz C: 0.2, 0.5, 1, 1.5, 2 MHz
6:00	Bowtie & 10T
9:00	Pulse & Bar C: No signal
11:00	Quad Phase
13:00 15:00	COMPOSITE Monoscope Video Phase, Diehedral

CR5-1B PS (8-960-096-91) Contents

TIME min, sec	VIDEO TRACK	AFM
0:00	RF Sweep Marker 1, 2, 4, 6, 8, 10, 12 MHz	No-Signal
2:00	60% H. Sweep (CTDM) Marker 0.5, 1, 2, 3, 4, 5 MHz	
5:00	Pulse & Bar (CTDM)	
8:00	Multi Burst Y:0.5, 1, 2, 4, 5, 5.5 MHz C:0.2, 0.5, 1, 1.5, 2 MHz	
11:00	Pulse & Bar	
14:00	100% Color Bars	400Hz Sine Wave 25kHz Deviation
16:30		75kHz Deviation
17:00	50% Bowtie & 10T	No-Signal
19:00	Line 17A Signal	
22:00	Quad Phase	
24:00	Flat Field	
26:00	100% Color Bars with dropout	
28:00 30:00	Composite H. Sweep with VISC	

【Switch Setting】

- Subcontrol Panel
  - SETUP switch : PRESET
  - Y/C DELAY switch : PRESET
  - HUE switch : PRESET
  - TBC CONTROL switch : INT
  - VIDEO INPUT switch : AUTO
  - TBC BYPASS switch : ON

- Level Control Panel
  - INPUT SELECT switch : COMPOSITE

- Function Control Panel
  - PB • PB/EE switch : PB/EE

- Connector Panel
  - REF VIDEO switch : EXT
  - REF VIDEO 75Ω termination : ON

【Connection】

Fig. 1

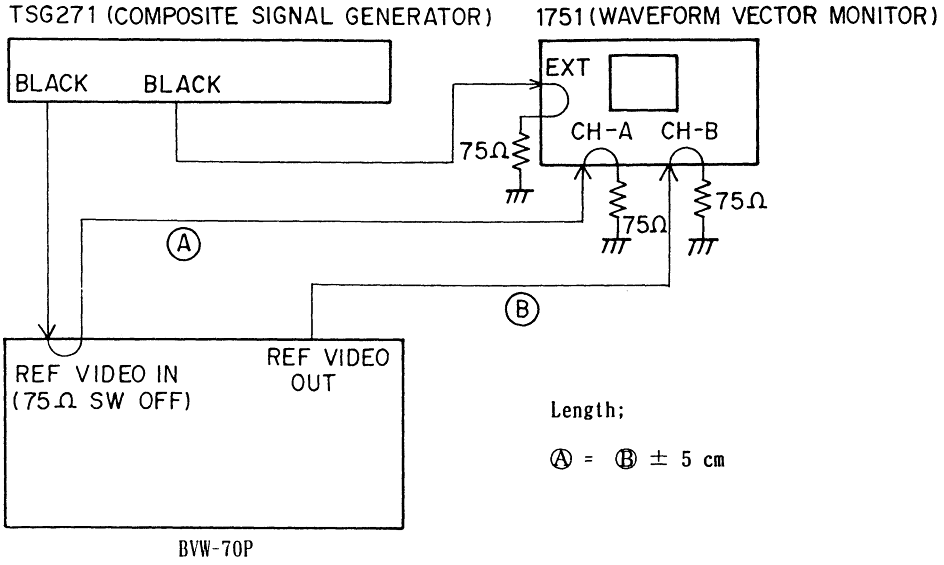

TSG271 (COMPOSITE SIGNAL GENERATOR)
1751 (WAVEFORM VECTOR MONITOR)
BLACK
BLACK
EXT
75Ω
CH-A
CH-B
75Ω
75Ω
Ⓐ
Ⓑ
REF VIDEO IN
(75Ω SW OFF)
REF VIDEO OUT
Length;
Ⓐ = Ⓑ ± 5 cm
BVW-70P

Fig. 2

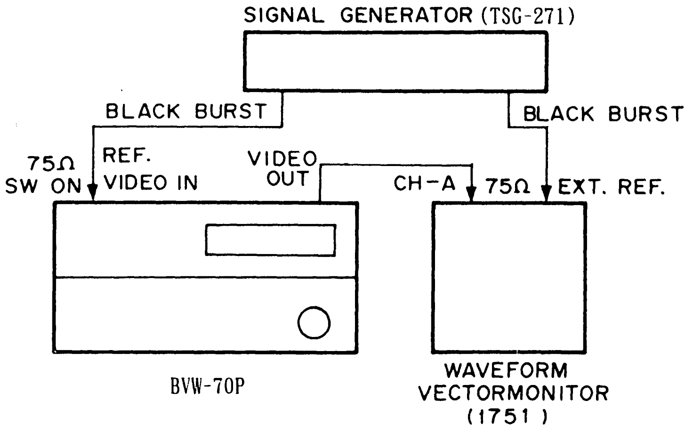

SIGNAL GENERATOR (TSG-271)
BLACK BURST
BLACK BURST
75Ω SW ON
REF. VIDEO IN
VIDEO OUT
CH-A
75Ω
EXT. REF.
BVW-70P
WAVEFORM VECTORMONITOR (1751)

Fig. 3

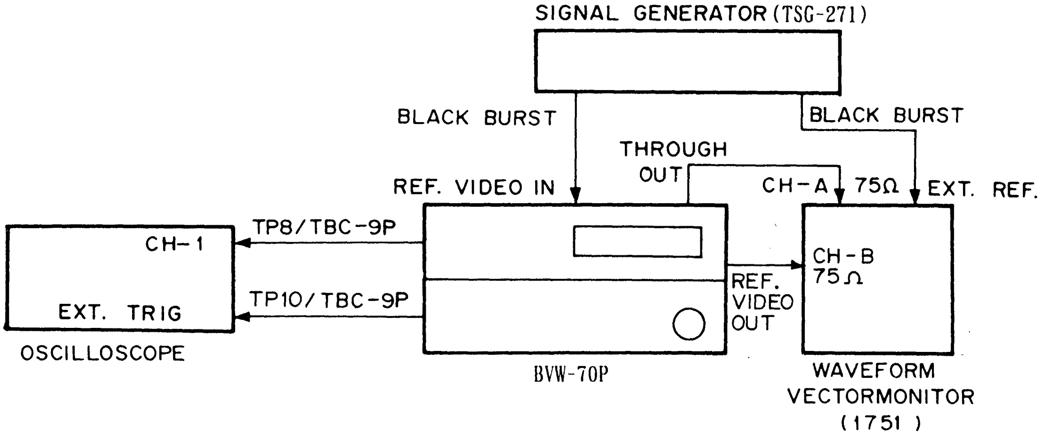

SIGNAL GENERATOR (TSG-271)
BLACK BURST
BLACK BURST
THROUGH OUT
REF. VIDEO IN
CH-A
75Ω
EXT. REF.
CH-1
EXT. TRIG
OSCILLOSCOPE
TP8/TBC-9P
TP10/TBC-9P
REF. VIDEO OUT
CH-B 75Ω
BVW-70P
WAVEFORM VECTORMONITOR (1751)

Fig. 4

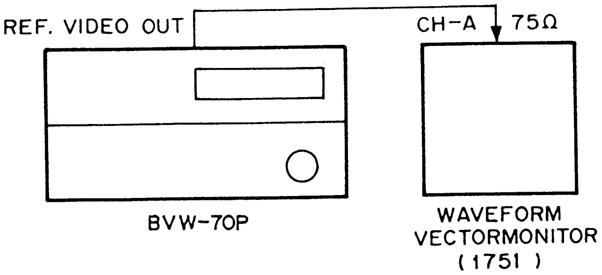

REF. VIDEO OUT
CH-A
75Ω
BVW-70P
WAVEFORM
VECTORMONITOR
(1751)

Fig. 5

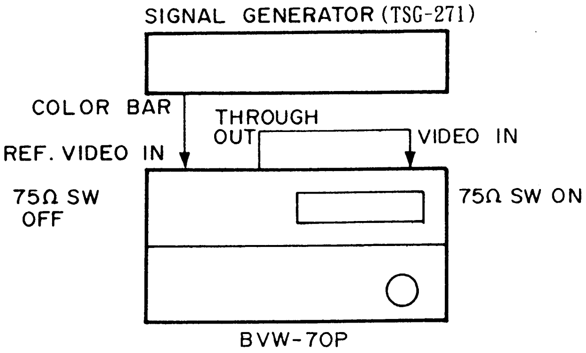

SIGNAL GENERATOR (TSG-271)
COLOR BAR
THROUGH
OUT
VIDEO IN
REF. VIDEO IN
75Ω SW
OFF
75Ω SW ON
BVW-70P

Fig. 6

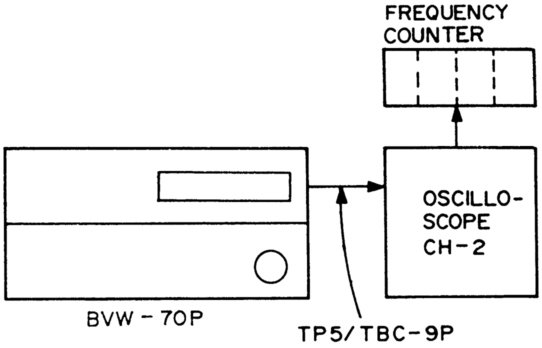
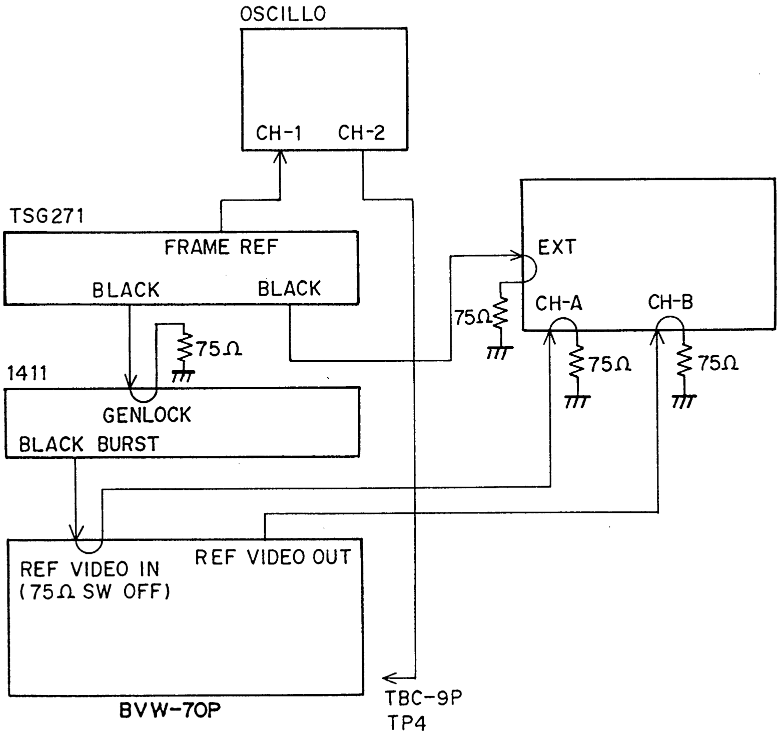
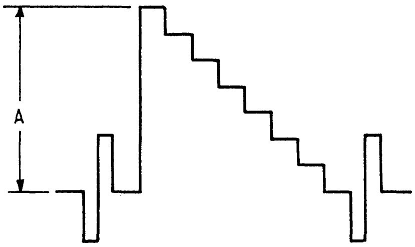

FREQUENCY
COUNTER
OSCILLO-
SCOPE
CH-2
BVW - 70P
TP5/TBC-9P

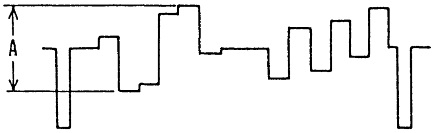
Fig. 7


OSCILLO
CH-1
CH-2
TSG271
FRAME REF
BLACK
BLACK
75Ω
1411
GENLOCK
BLACK BURST
EXT
75Ω
CH-A
CH-B
75Ω
75Ω
REF VIDEO IN
(75Ω SW OFF)
REF VIDEO OUT
BVW-70P
TBC-9P
TP4

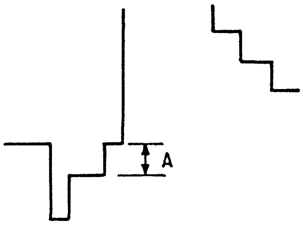
13-1. Y-AD IN LEVEL ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Play back a 100% color-bars signal on alignment tape CR5-1B PS.	TP101/TBC-7D, 7E(G-2)  A = 1.60 ± 0.05 Vp-p	⊘RV100/TBC-7D, 7E(F-2) TRIG: TP101/TBC-7D, 7E(G-2)

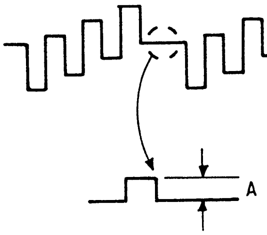
13-2. C-AD IN LEVEL ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Play back a 100% color-bars signal on alignment tape CR5-1B PS.	TP401/TBC-7D, 7E(C-2)  A = 1.75 ± 0.05 Vp-p	⊘RV400/TBC-7D, 7E(C-2) TRIG: TP401/TBC-7D, 7E(C-2)

13-3. Y-AD IN PEDESTAL CLAMP ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Play back a 100% color-bars signal on alignment tape CR5-1B PS.	TP201/TBC-12P(B-1)  A = 0 No level difference should appear.	⊘RV101/TBC-7D, 7E(F-2) Turn RV101 clockwise so that the specification is met after it is fully turned counterclockwise. TRIG: TP201/TBC-12P(B-1)

13-4. C-AD IN CLAMP LEVEL ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Play back a 100% color-bars signal on alignment tape CR5-1B PS.	TP501/TBC-12P(A-1)  A = 0 No level difference should appear.	⊘RV401/TBC-7D, 7E(C-2) Turn RV401 clockwise so that the specification is met after it is fully turned counterclockwise. TRIG: TP501/TBC-12P(A-1)

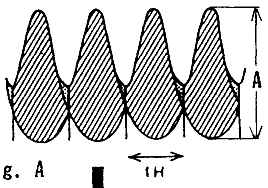
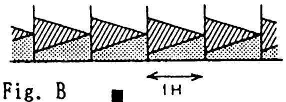
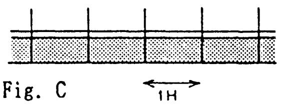
13-5. Y-NORMAL VCO ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Supply a 100% color-bars signal to the COMPONENT 2 IN connector. • MODE: EE • Supply a black burst signal to the REF VIDEO IN connector. • INPUT SELECT sw: Y-R, B • Using a digital voltmeter.	TP201/TBC-7D, 7E(H-5) TP207 - TP201 = 0 ± 0.1 Vdc (Make the dc level at TP201 coincide with that at TP207.)	⊘LV200/TBC-7D, 7E(H-5)

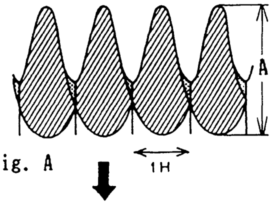
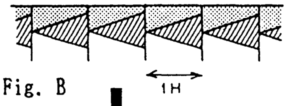
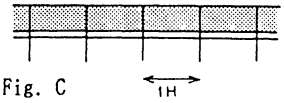
13-6. C NORMAL VCO ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Supply a 100% color-bars signal to the COMPONENT 2 IN connector. • Supply a black burst signal to the REF VIDEO IN connector. • MODE: EE • INPUT SELECT sw: Y-R, B • Using a digital voltmeter.	TP501/TBC-7D, 7E(B-5) TP506 - TP501 = 0 ± 0.1 Vdc (Make the dc level at TP501 coincide with that at TP506.)	⊘LV500/TBC-7D, 7E(B-5)

13-7. Y-WCK FREQUENCY ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Supply a 100% color-bars signal to the COMPONENT 2 IN connector. • Supply a black burst signal to the REF VIDEO IN connector. • MODE: EE • Set the range of the oscilloscope to 1Vdc, 20μs/DIV and measure it in the CH-1/CH-2 (INT) ADD mode. • INPUT SELECT sw: Y-R, B	CH-1: TP801/TBC-12P(H-1) CH-2: TP203/TBC-7D, 7E(G-4) Inverted and added signal waveform at TP801/TBC-12P and TP203/TBC-7D, 7E  Fig. A  Fig. B  Fig. C Minimize the added waveform A using the SYNC FINE VR on the subcontrol panel as shown in Fig. B, and make the frequency coincide each other using RV201 as shown in Fig. C (if the lines are parallel, the frequency coincides).	SYNC FINE VR/Subcontrol panel (Phase adjustment) ⊘RV201/TBC-7D, 7E(F-7) (Frequency adjustment) TRIG: EXT. black burst HD

13-8. C-WCK FREQUENCY ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Supply a 100% color-bars signal to the COMPONENT 2 IN connector. • Supply a black burst signal to the REF VIDEO IN connector. • MODE: EE • Set the range of the oscilloscope to 1Vdc, 20μs/DIV and measure it in the CH-1/CH-2 (INT) ADD mode. • INPUT SELECT sw: Y-R, B	CH-1: TP801/TBC-12P(H-1) CH-2: TP502/TBC-7D, 7E(C-5) Inverted and added signal waveform at TP801/TBC-12P and TP502/TBC-7D, 7E  Fig. A  Fig. B  Fig. C Minimize the added waveform A using the SYNC FINE VR on the subcontrol panel as shown in Fig. B, and make the frequency coincide each other using RV501 as shown in Fig. C (if the lines are parallel, the frequency coincides).	SYNC FINE VR/subcontrol panel (Phase adjustment) ⊘RV501/TBC-7D, 7E(A-2) (Frequency adjustment) TRIG: EXT. black burst HD

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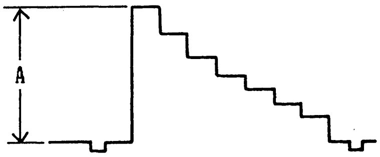
13-9. Y-WCK FRB. ERROR VOLTAGE ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• PB. PB/EE sw: PB • Turn S200 on the TBC-7D, 7E board to OFF (right side), and S1 on the EN-48P board to ON (right side). • Insert alignment tape CR5-1B PS and play back a 100% color-bars signal into the SEARCH REV ×24 mode. • After adjustment is completed, set the PB. PB/EE switch to PB/EE and set S200 on the TBC-7D, 7E board and S1 on the EN-48P board to the former position. • Using a digital voltmeter.	TP202/TBC-7D, 7E(J-7) 6.0 ± 0.1 Vdc	⊘LV201/TBC-7D, 7E(J-4)

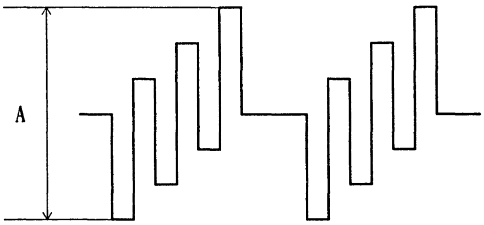
13-10. Y-FFB OFFSET ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
Step 1 • Turn S200 on the TBC-7D, 7E board to OFF (right side), and S1 on the EN-48P board to ON (right side). • Play back a 100% color-bars signal on alignment tape CR5-1B PS into the SEARCH REV ×5 mode. • Using a digital voltmeter.	TP202/TBC-7D, 7E(J-7) 3.5 ± 0.1 Vdc	⊘RV202/TBC-7D, 7E(J-5)
Step 2 • Play back a 100% color-bars signal on alignment tape CR5-1B PS into the SEARCH FWD ×5 mode. • After adjustment is completed, set S200 on the TBC-7D, 7E board and S1 on the EN-48P board to the former position. • Using a digital voltmeter.	TP202/TBC-7D, 7E(J-7) 7.5 ± 0.1 Vdc	⊘RV203/TBC-7D, 7E(J-6)

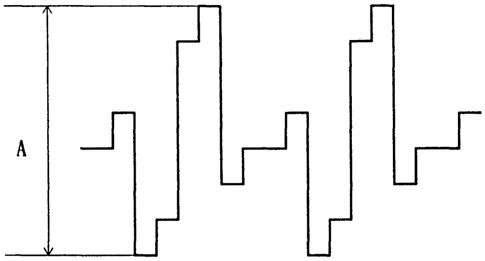
13-11. Y LEVEL ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Supply a black burst signal to the REF VIDEO IN connector. • Play back a 100% color-bars signal on alignment tape CR5-1B PS.	TP201/TBC-12P(B-1)  A = 1.0 ± 0.01 Vp-p	⊘RV200/TBC-12P(E-1) TRIG: TP201/TBC-12P(B-1)

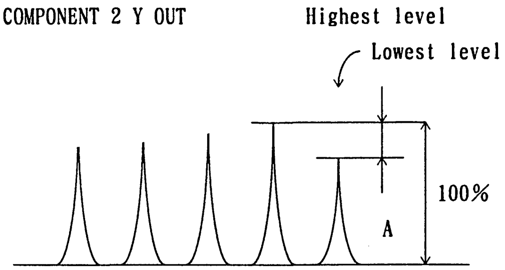
13-12. C LEVEL ADJUSTMENT (B-Y)

machine conditions for adjustment	specifications	adjustments
• Supply a black burst signal to the REF VIDEO IN connector. • Play back a 100% color-bars signal on alignment tape CR5-1B PS.	TP501/TBC-12P(A-1)  A = 1.20 ± 0.02 Vp-p	⊘RV500/TBC-12P(E-1) TRIG: TP501/TBC-12P(A-1)

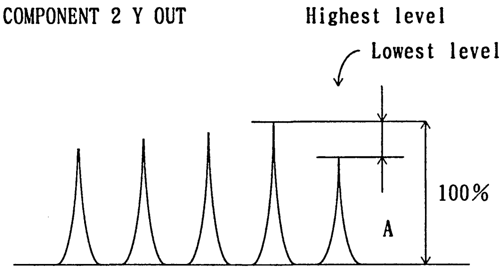
13-13. C LEVEL ADJUSTMENT (R-Y)

machine conditions for adjustment	specifications	adjustments
• Supply a black burst signal to the REF VIDEO IN connector. • Play back a 100% color-bars signal on alignment tape CR5-1B PS.	TP503/TBC-12P(B-1)  A = 1.20 ± 0.02 Vp-p	⊘RV502/TBC-12P(E-1) TRIG: TP503/TBC-12P(B-1)

13-14. Y LINEARITY ADJUSTMENT

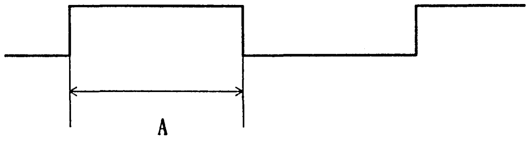
machine conditions for adjustment	specifications	adjustments
• INPUT SELECT sw: Y-R, B • Supply a 5 STEP signal to COMPONRNT 2 Y IN connector. • MODE: EE • WFM RESPONSE: DIFF'D STEP	COMPONENT 2 Y OUT  A ≦ 3 %	⊘RV103/TBC-7D, 7E(F-4) TRIG: INT

13-15. C LINEARITY ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• INPUT SELECT sw: Y-R, B • Supply a 5 STEP signal to COMPONRNT 2 R-Y IN connector. • MODE: EE • WFM RESPONSE: DIFF'D STEP	COMPONENT 2 Y OUT  A ≦ 4 %	⊘RV402/TBC-7D, 7E(C-4) TRIG: COMPONENT 2 Y OUT

13-16. HALF H BLANKING ADJUSTMENT

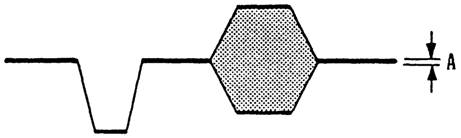
• Sections 13-16 to 13-25 should be performed before Section 12.

machine conditions for adjustment	specifications	adjustments
• Power ON.	TP9/TBC-9P(A-1)  A = 42.5 ± 0.5 μsec	⊘RV11/TBC-9P(B-2) TRIG: TP9/TBC-9P(A-1)

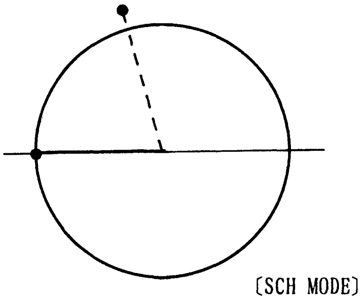
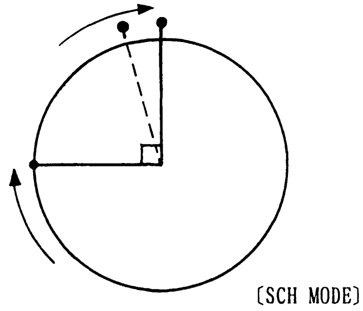
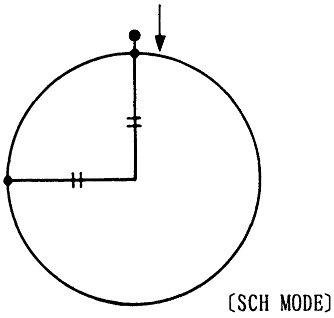
13-17. INT SUBCARRIER FREQUENCY ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Set the REF VIDEO IN and DUB/ COMPONENT 1 OUT connectors to OPEN. • CONNECTION: Fig. 6	TP5/TBC-9P(B-5) SC frequency 4,433,619 ± 10 Hz	⊘RV1/TBC-9P(D-5)

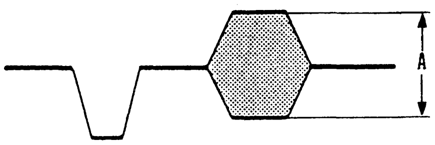
13-18. REF VIDEO OUT CARRIER BALANCE ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Supply a black burst signal to the REF VIDEO OUT connector. • CONNECTION: Fig. 4	REF VIDEO OUT (Terminated in 75 ohms.)  A : Minimize (10 mVp-p or less)	⊘RV8/TBC-9P(D-6) TRIG: INT

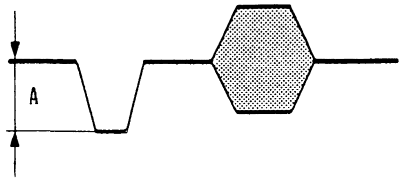
13-19. REF VIDEO BURST PHASE/BALANCE ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
Step 1 • REF VIDEO IN 75 Ω sw: OFF • Terminate the waveform vector monitor CH-A in 75 ohms and set the VECT ×5 mode. • CONNECTION: Fig. 1 • Set the GAIN to UNCAL mode.	CH-A : REF. VIDEO OUT  • Adjust using the GAIN UNCAL VR and the PHASE VR of the waveform vector nonitor so that the lower point of the burst signal is shifted to 0° in the circumference.	GAIN UNCAL VR/1751 PHASE VR/1751
Step 2	CH-A : REF. VIDEO OUT  • Adjust so that the angle of the burst phase is set to 90°.	⊘RV7/TBC-9P(C-5)
Step 3	CH-A : REF. VIDEO OUT  • Adjust so that both the two points of the burst are in the circumfernce.	⊘RV6/TBC-9P(C-5)

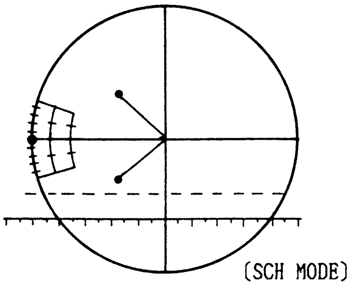
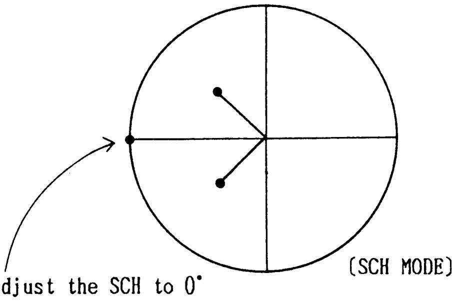
13-20. REF VIDEO OUT BURST LEVEL ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Supply a black burst signal to the REF VIDEO IN connector. • CONNECTION: Fig. 4	REF VIDEO OUT (Terminated in 75 ohms.)  A = 300 ± 10 mVp-p	⊘RV9/TBC-9P(D-6) TRIG: INT

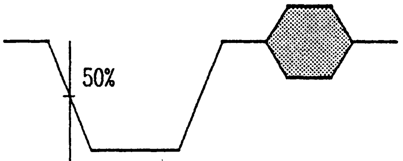
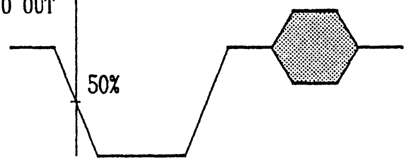
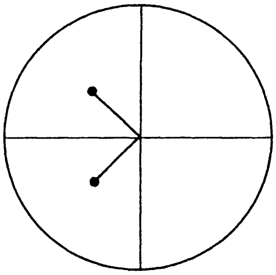
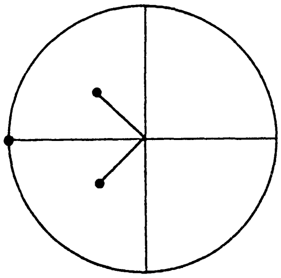
13-21. REF VIDEO OUT SYNC LEVEL ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Supply a black burst signal to the REF VIDEO IN connector. • CONNECTION: Fig. 4	REF VIDEO OUT (Terminated in 75 ohms.)  A = 300 ± 10 mVp-p	⊘RV10/TBC-9P(C-7) TRIG: INT

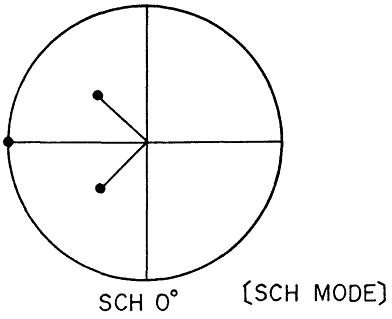
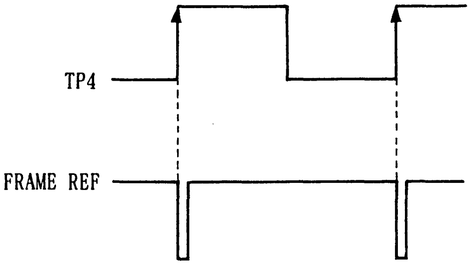
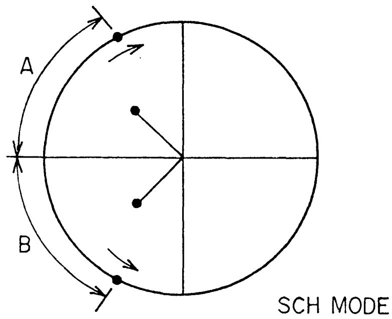
13-22. INT SUBCARRIER PHASE ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
- Set the REF VIDEO IN connector to OPEN. - Terminate the waveform vector monitor's CH-A in 75 ohms and set the EXT REF button to INT. - CONNECTION: Fig. 4	Step 1 CH-A : REF. VIDEO OUT  - Adjust using the waveform vector monitor's PHASE control so that the burst phase is set to the scale marker.	
	Step 2 CH-A : REF. VIDEO OUT  Adjust the SCH to 0° - Adjust the SCH's luminance spot according to the specification.	⊘RV4/TBC-9P(E-5)

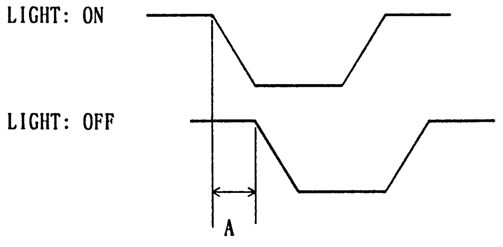
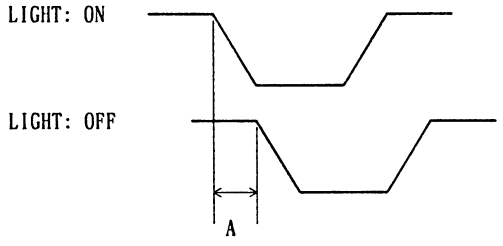
13-23. SYNC PHASE ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• REF VIDEO IN 75 Ω sw: OFF • Set the EXT REF button of the waveform vector monitor to ON. • CONNECTION: Fig. 1 • Push SWEEP MAG on the waveform vector monitor. (SWEEPS • • • 2H)	Step 1 ROUGH ADJ. 〔WFM MODE〕 CH-A: REF VIDEO IN  CH-B: REF VIDEO OUT  Same phase • Adjust by pressing CH-A and CH-B switches of the 1751 alternately.	⊘RV2/TBC-9P(D-4) TRIG: TSG-271 BLACK
	Step 2 〔SCH MODE〕 CH-A: REF VIDEO IN CH-B: REF VIDEO OUT  • Adjust by pressing CH-A and CH-B switches of the 1751 alternately. • Adjust the burst phase in CH-B with that CH-A. (CH-A Ref.)	⊘RV5/TBC-9P(D-5) TRIG: TSG-271 BLACK
	Step 3 CH-A: REF VIDEO IN CH-B: REF VIDEO OUT  〔SCH:MODE〕 • Adjust by pressing CH-A and CH-B switches of the 1751 alternately. • Adjust the SCH phase in CH-B with that CH-A. (CH-A Ref.)	⊘RV2/TBC-9P(D-4) TRIG: TSG-271 BLACK TRIG: TSG-271 BLACK

13-24. REF 1st FIELD ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
Step 1 • CONNECTION: Fig. 7	CH-A: REF.VIDEO IN THROUGH OUT 	⊘SUBCARRIER VR/1411 ⊘PHASE VR/1751
Step 2	CH-1: TP4/TBC-9P(C-4) CH-2: FRAME REF/TSG-271  Adjust the FRAME REF pulse so that appears at the falling edge of TP4.	• Tentative adjustment ⊘RV12/TBC-9P(C-4)
Step 3	CH-A: REF.VIDEO IN THROUGH OUT  A = B ± 5° When the SUBCARRIER VR is turned colckwise and counterclockwise, the pulse signal, which appears at the rising edge of TP4, is changed to be appeared at the falling eade. At this time, adjust RV12 so that phase A of SCH coincides with phase B.	⊘RV12/TBC-9P(C-4)

13-25. SV SYNC ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
Step 1 • Supply a 100% color-bars signal to COMPONENT 2 IN connector. • INPUT SELECT sw: Y-R, B • PB/PB.EE sw: PB.EE • Supply a black burst signal to REF.VIDEO IN conector. • Press ASSEMBLE botton on the flont panel. (lights)	TP201/SV83(C-1)  A = 0 Adjust the phase when the ASSEMBLE botton is perssed vepeatendly.	⊘RV3/TBC-9P(C-4) TRIG: TP1/TBC-9P(D-5)
Step 2 • Supply a 100% color-bars signal to VIDEO IN connector. • INPUT SELECT sw: COMPOSITE	TP201/SV83(C-1)  A = 0 Adjust the phase when the ASSEMBLE botton is perssed vepeatendly.	⊘RV15/TBC-9P(C-3) TRIG: TP1/TBC-9P(D-5)

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SECTION 14
OVERALL VIDEO ALIGNMENT

Adjustment during Board Replacement

(a) When replacing the TBC-7D, 7E and TBC-12P boards at the same time, adjust from Section 14-1.

(b) When replacing only the defective TBC-7D, 7E board, directly adjust from Section 14-2.

(c) When replacing only the defective TBC-12P board, directly adjust from Section 14-2.

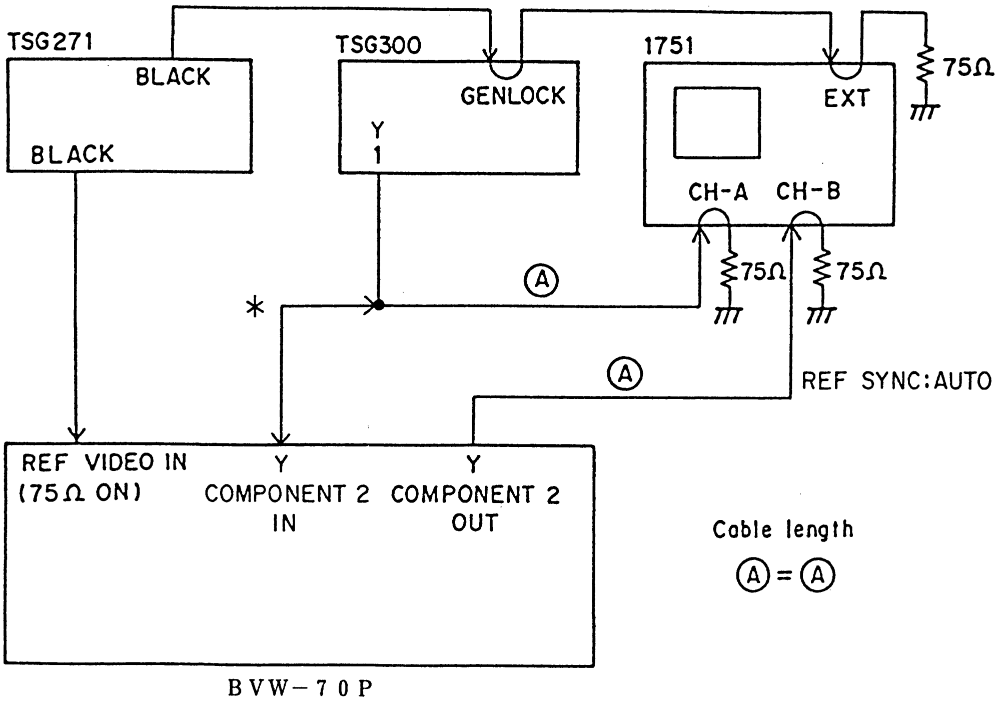
- For Step 3 in Section 14-2-1, however, adjust using RV702 (C-3) on the NR-32 board instead of RV200 on the TBC-7D, 7E board.
- For Section 14-2-2, adjust using RV701 (C-3) on the NR-32 board instead of RV500 on the TBC-7D, 7E board.

  RV501 on the TBC-12P board can be used for adjustment as it is.

14-1. DIGITAL OUT VIDEO PHASE, Y/C DELAY ADJUSTMENT (USING A SIGNAL GENERATOR, SG-161 (A-6336-170-A))

【Connection】

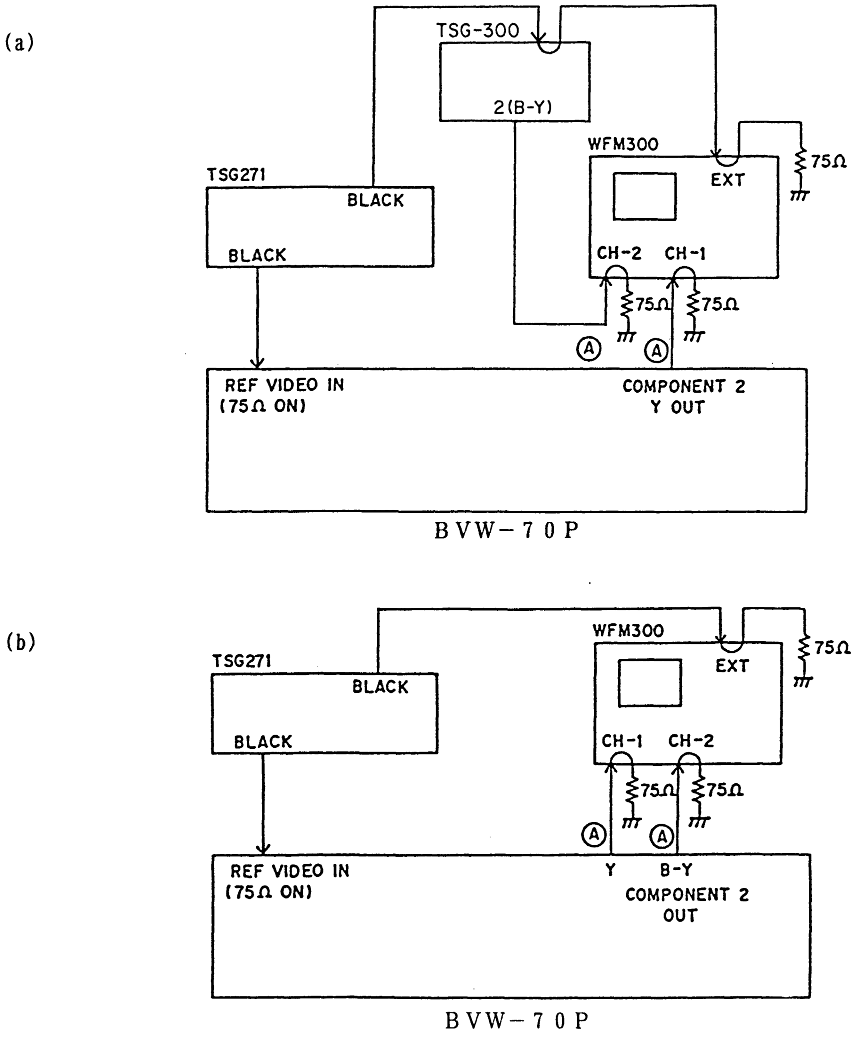
Fig 1


TSG271
BLACK
BLACK
TSG300
GENLOCK
Y
1
1751
EXT
75Ω
CH-A
CH-B
75Ω
75Ω
Ⓐ
*
Ⓐ
REF SYNC:AUTO
REF VIDEO IN
(75Ω ON)
Y
COMPONENT 2
IN
Y
COMPONENT 2
OUT
Cable length
Ⓐ=Ⓐ
BVW-70P

The length of cables marked with Ⓐ should all be the same.

*: Not necessary for SIGNAL GENERATOR, SG-161

Fig 2


(a)
TSG-300
2(B-Y)
WFM300
EXT
75Ω
TSG271
BLACK
BLACK
CH-2
CH-1
75Ω
75Ω
Ⓐ
Ⓐ
REF VIDEO IN
(75Ω ON)
COMPONENT 2
Y OUT
BVW-70P
(b)
WFM300
EXT
75Ω
TSG271
BLACK
BLACK
CH-1
CH-2
75Ω
75Ω
Ⓐ
Ⓐ
REF VIDEO IN
(75Ω ON)
Y
B-Y
COMPONENT 2
OUT
BVW-70P

The length of cables marked with Ⓐ should be all the same.

【Switch setting】

- 1751 Waveform vector monitor

MODE : WFM, SCH
INPUT : A ↔ B
SWEEPS : 2H MAG
DC RESET : OFF
FILTERS : FLAT
CAL : OFF
EXT REF : ON
FIELD SELECT : OFF
GAIN : NORMAL
LINE SELECTOR : OFF

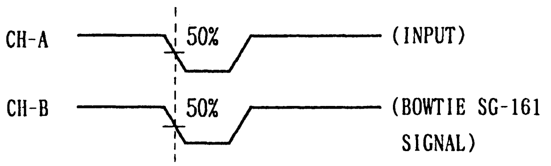
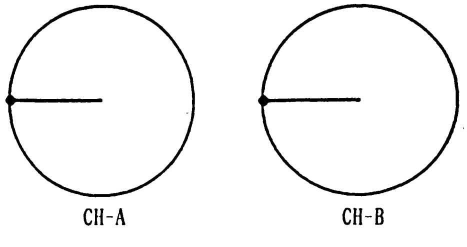
- WFM300 Component WFM

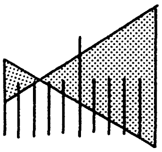
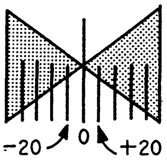
MODE : BOWTIE
VERTICAL GAIN : ×5
HORIZONTAL MAG: OFF

- TSG 300

3 WIRE MODE
50% BOWTIE

Note: That the SG-161 outputs 100% bowtie signal, but TSG-300 recommendation is 50% bowtie, but no problems since signal is not recorded.

machine conditions for adjustment	specifications	adjustments
Step 1 • Remove the TBC-7D, 7E and TBC-12P boards.		
Step 2 • Insert extension board the SG-161 into the TBC-12P board position and plug the TBC-12P board onto it. • LEAVE OUT TBC-7D, 7E BOARD. • CONNECTION: Fig 1	*Set TSG-300 GENLOCK TIMING with respect to TSG-271.	
Step 3 (coarse) • INPUT SELECT sw: Y-R, B • CAPSTAN LOCK sw/subcontorl panel : 2FD	COMPONENT 2 Y OUT/connector panel (WFM MODE/WAVEFORM VECTOR MONITOR)  CH-A 50% (INPUT) CH-B 50% (BOWTIE SG-161 SIGNAL) Check that the phase on CH-B coincides with that on CH-A when the CH-A and CH-B switches are pressed alternately. (CH-A REF) Adjust so that the phase at the trailing edge of a CH-B sync signal coincides with that of a CH-A sync signal.	SYNC controls/subcontrol panel (FINE: mechanical center)
Step 4 (FINE)	COMPONENT 2 Y OUT/connector panel (SCH MODE/WAVEFORM VECTOR MONITOR)  Check that the phase on CH-B coincides with that on CH-A when the CH-A and CH-B switches are pressed alternately. (CH-A REF) Adjust so that the CH-B sync phase coincides with the CH-A sync phase.	• CH-A PHASE control/ waveform vector monitor • CH-B SYNC (FINE) controls/sub-control panel

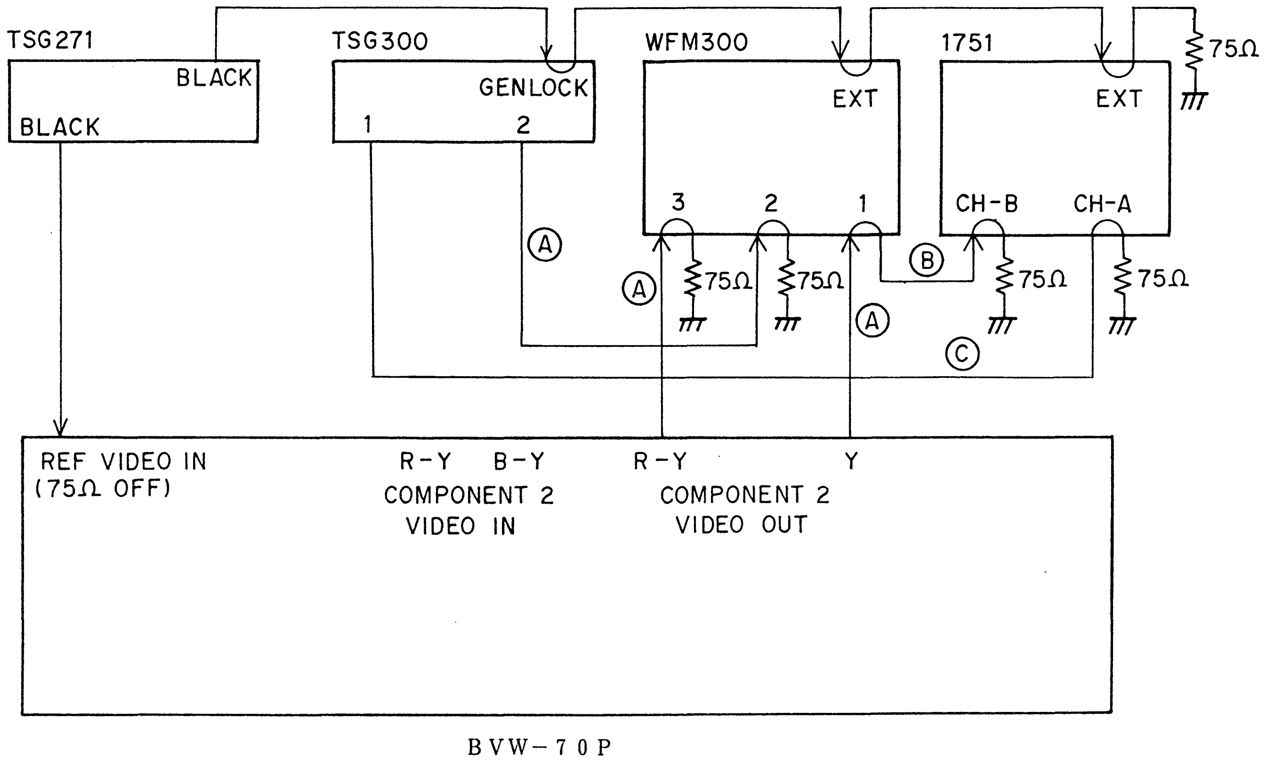
Step 5	Put the WAVEFORM VECTOR MONITOR again into the WFM mode. Check that the phase at the trailing edge of CH-A and CH-B sync signals are not shifted.	
Step 6 (VIDEO Phase) • VIDEO sw/subcontrol panel: MANUAL • CONNECTION: Fig 2 (a) • After adjustment is completed, set VIDEO switch to PRESET.	COMPONENT 2 OUT/connector panel (BOWTIE MODE/COMPONENT WFM) CH-1/CH-2 (Y/B-Y)  Minimized the dip point. Adjust the dip point to the center marker. Y/B-Y: 0 ± 10 nsec	VIDEO control/subcontrol panel ⊘RV702/NR-32(C-3) on the TBC-12P board. This adjustment conforms to that the SG-161 (EXT SYNC) is genlocked.
Step 7 (Y/C DELAY) • CHROMA sw/subcontrol panel: MANUAL • CONNECTION: Fig 2 (b) • After adjustment is completed, set CHROMA switch to PRESET.	COMPONENT 2 OUT/connector panel (BOWTIE MODE/COMPONENT WFM) CH-1/CH-2 (Y/B-Y)  Minimized the dip point. Adjust the dip point to the center marker. Y/B-Y: 0 ± 10 nsec	CHROMA control/subcontrol panel ⊘RV701/NR-32(C-3) on the TBC-12P board.
Step 8 • Remove extension board the SG-161 and insert the TBC-7D, 7E and TBC-12P boards into the previous position.		

14-2. PB VIDEO PHASE Y/C DELAY, C/C DELAY ADJUSTMENT

14-2-1. PB Component Video Phase Adjustment

【Connection】

Fig 1


TSG271
BLACK
BLACK
TSG300
GENLOCK
1
2
WFM300
EXT
3
2
1
1751
EXT
CH-B
CH-A
75Ω
Ⓐ
Ⓑ
Ⓒ
REF VIDEO IN
(75Ω OFF)
R-Y B-Y
COMPONENT 2
VIDEO IN
R-Y Y
COMPONENT 2
VIDEO OUT
BVW-70P

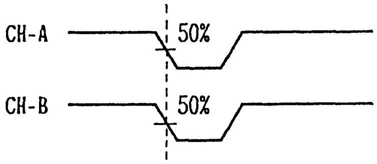
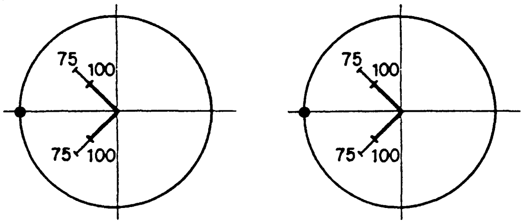
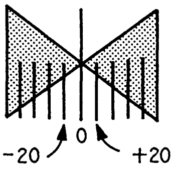
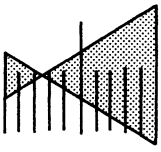
The length of the cables marked with Ⓐ should be all the same.

Ⓒ=Ⓑ+Ⓐ× 2

Ⓓ=Ⓐ× 2

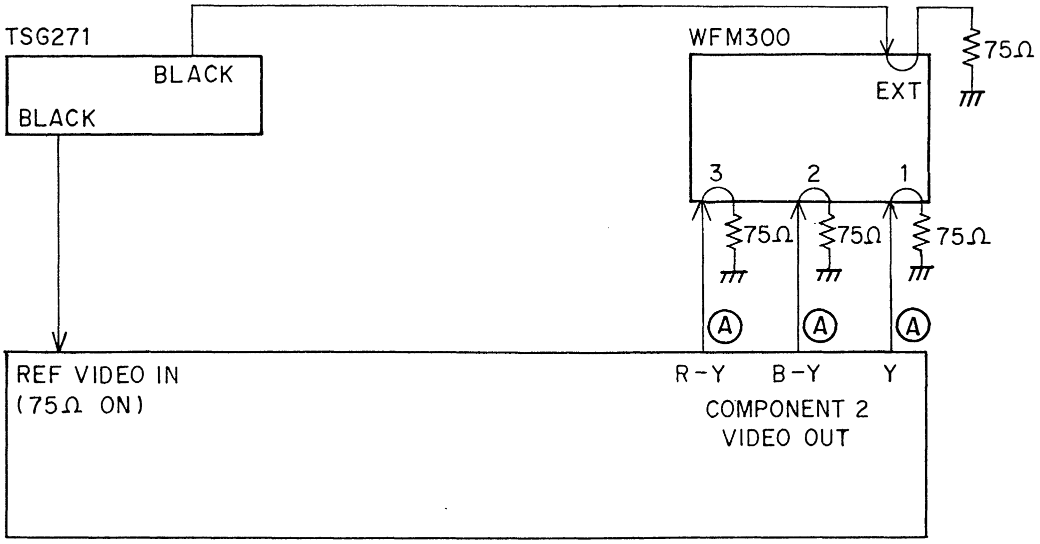
【Switch Setting】

- 1751 Waveform vector monitor
  - MODE : WFM, SCH
  - INPUT : A ↔ B
  - SWEEPS : 2H MAG
  - DC RESET : OFF
  - FILTERS : FLAT
  - CAL : OFF
  - EXT REF : ON
  - FIELD SELECT : OFF
  - GAIN : NORMAL
  - LINE SELECTOR : OFF
- WFM300 Component WFM
  - MODE : BOWTIE
  - VERTICAL GAIN : ×5
  - HORIZONTAL MAG: OFF
- TSG 300
  - 3 WIRE MODE
  - 50% BOWTIE

machine conditions for adjustment	specifications	adjustments
Step 1 • Play back a 50% bowtie & 10T signal on alignment tape CR5-1B PS. • CAPSTAN LOCK sw: 2FD	COMPONENT 2 Y OUT/connector panel (WFM MODE/WAVEFORM VECTOR MONITOR)  Adjust so that the phase at the trailing edge of CH-B sync signal coincides with that of CH-A sync signal. Check that the phase on CH-B coincides with that on CH-A when the CH-A and CH-B switches are pressed alternately. (CH-A REF)	SYNC controls/ subcontrol panel (FINE: mechanical center) TRIG: TSG271 BLACK
Step 2 • Play back a 50% bowtie & 10T signal on alignment tape CR5-1B PS.	COMPONENT 2 Y OUT/connector panel (SCH MODE/WAVEFORM VECTOR MONITOR)  CH-A CH-B Adjust so that the CH-B dync phase coincides with the CH-A sync phase. Check that the phase on CH-B coincides with that on CH-A when the CH-A and CH-B switches are pressed alternately. (CH-A REF)	• CH-A PHASE control/waveform vector monitor • CH-B SYNC (FINE) control/ subcontrol panel
Step 3 • VIDEO INPUT sw/subcontrol panel: MANUAL • After adjustment is completed, set VIDEO INPUT switch to PRESET.	COMPONENT 2 Y OUT/connector panel (BOWTIE MODE/COMPONENT WFM) CH-1/CH-2 (Y/B-Y)  CH-1/CH-3 (Y/R-Y)  Minimized the dip point. Adjust the dip point to the center marker. Y/B-Y: 0 ± 10 nsec	VIDEO control/subcontrol panel ⊘RV200/TBC-7D, 7E(J-3) TRIG: TSG271 BLACK

14-2-2. PB Component Metal Y/C, C/C Delay Adjustment

【Connection】


TSG271
BLACK
BLACK
WFM300
EXT
75Ω
3
2
1
75Ω
75Ω
75Ω
Ⓐ
Ⓐ
Ⓐ
REF VIDEO IN
(75Ω ON)
R-Y
B-Y
Y
COMPONENT 2
VIDEO OUT

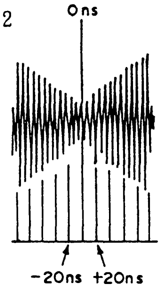
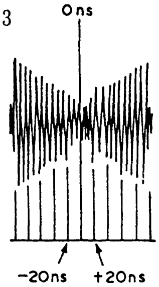
BVW-70P

The length of cables marked with Ⓐ should be all the same.

【Switch Setting】

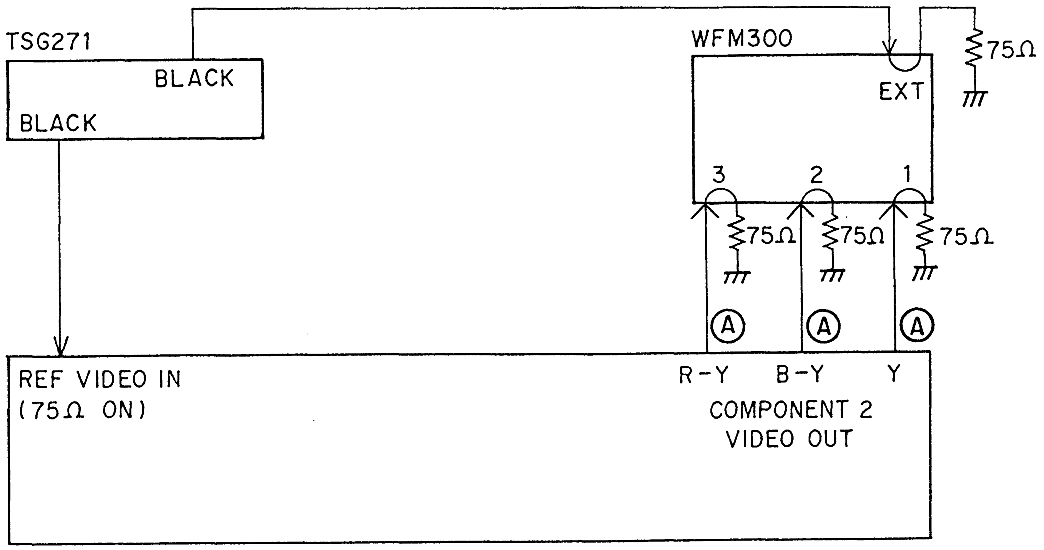
- WFM300 Component WFM

MODE : BOWTIE
VERTICAL GAIN : ×5
HORIZONATAL MAG : OFF

machine conditions for adjustment	specifications	adjustments
• Play back a 50% bowtie & 10T signal on alignment tape CR5-1B PS. • CHROMA sw/subcontrol panel: MANUAL • After adjustment is completed, set CHROMA control to PRESET.	COMPONENT 2 OUT/connector panel (BOWTIE MODE/COMPONENT WFM) CH-1/CH-2 (Y/B-Y)  0ns -20ns +20ns CH-1/CH-3 (Y/R-Y)  0ns -20ns +20ns Minimized the dip point. Adjust the dip point to the center marker. 0 ± 10 nsec If the adjustment cannot be made using RV500, remove the short chip of R853 on the solder side and connect it to R852.	CHROMA control/subcontrol panel • Y/B-Y ⊘RV500/TBC-7D, 7E(C-7) • Y/R-Y ⊘RV501/TBC-7D, 7E(E-1) * Adjust the RV500 as before. TRIG: TSG271 BLACK

14-2-3. PB Component Oxide Y/C Delay Adjustment

【Connection】

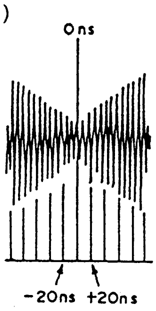
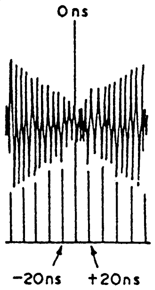

TSG271
BLACK
BLACK
WFM300
EXT
75Ω
3
2
1
75Ω
75Ω
75Ω
Ⓐ
Ⓐ
Ⓐ
REF VIDEO IN
(75Ω ON)
R-Y
B-Y
Y
COMPONENT 2
VIDEO OUT
BVW-70P

The length of cables marked with Ⓐ should be all the same.

【Switch Setting】

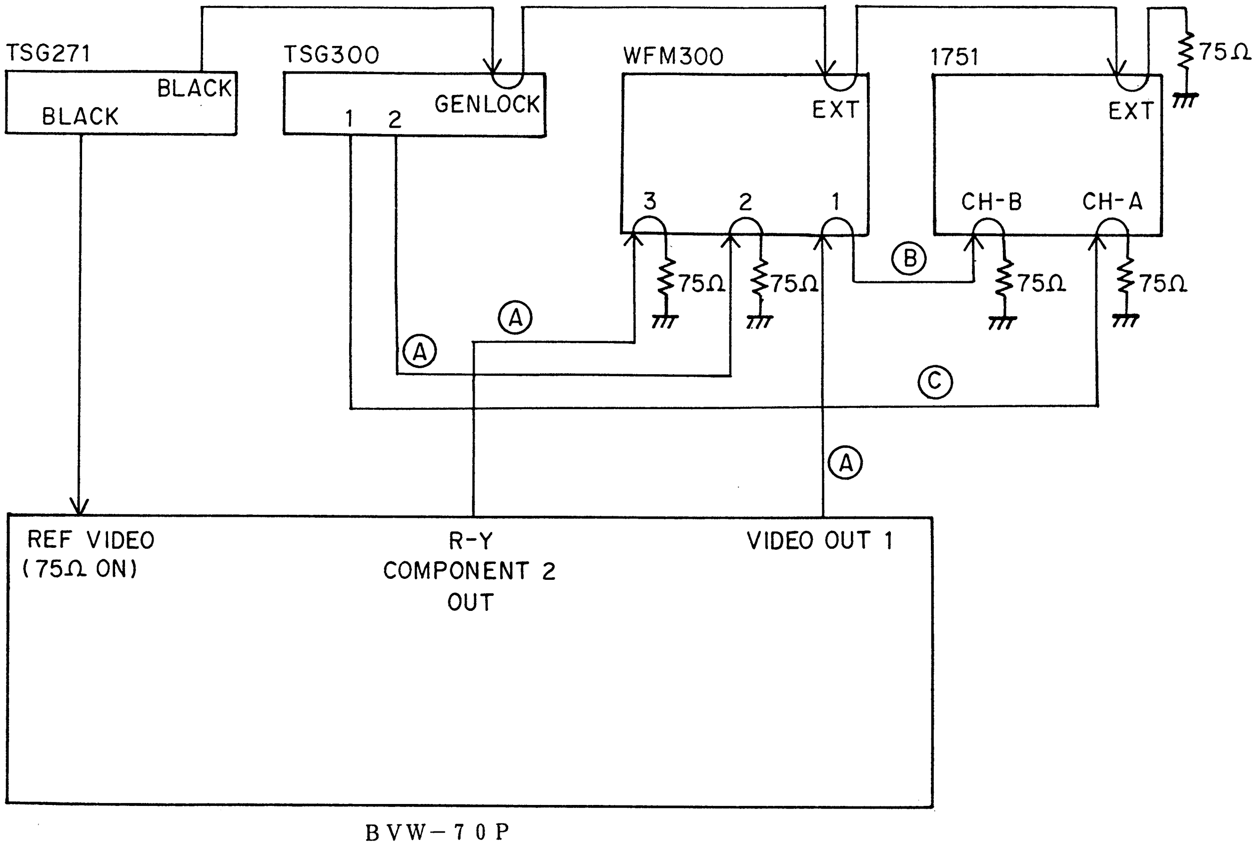
- WFM300 Component WFM

MODE : BOWTIE
VERTICAL GAIN : ×5
HORIZONATAL MAG : OFF

machine conditions for adjustment	specifications	adjustments
• Play back a bowtie signal on alignment tape CR5-2A PS. • CHROMA control/subcontrol panel: MANUAL • After adjustment is completed, set CHROMA switch to PRESET.	COMPONENT 2 OUT/connector panel (BOWTIE MODE/COMPONENT WFM) CH-1/CH-2 (Y/B-Y)  0ns -20ns +20ns CH-1/CH-3 (Y/R-Y)  0ns -20ns +20ns Minimized the dip point. Adjust the dip point to the center marker. 0 ± 10 nsec • When the adjustment cannot be made using RV503, remove the short chip of R853 on the solder side and connect it to R852.	CHROMA control/ subcontrol panel ⊘RV503/TBC-7D, 7E(B-6)

14-2-4. PB Composite Video Phase Adjustment

【Connection】


TSG271
BLACK
BLACK
TSG300
1
2
GENLOCK
WFM300
EXT
3
2
1
1751
EXT
CH-B
CH-A
75Ω
75Ω
75Ω
75Ω
75Ω
Ⓐ
Ⓐ
Ⓐ
Ⓑ
Ⓒ
REF VIDEO
(75Ω ON)
R-Y
COMPONENT 2
OUT
VIDEO OUT 1
BVW-70P

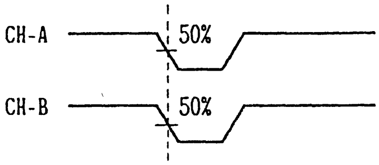
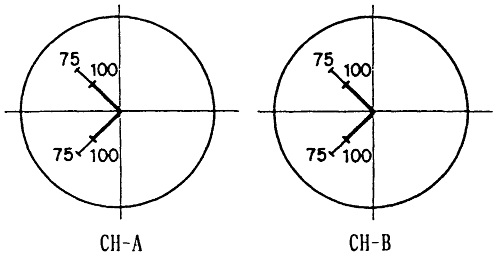
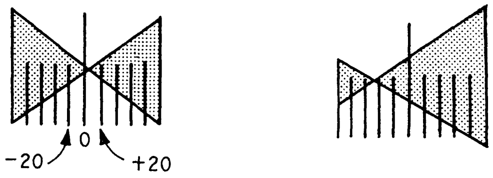
【Switch Setting】

- 1751 Waveform vector monitor
  MODE : WFM ↔ SCH
  INPUT : A ↔ B
  SWEEPS : 2H MAG
  DC RESET : OFF
  FILTERS : FLAT
  CAL : OFF
  EXT REF : ON
  FIELD SELECT : OFF
  GAIN : NORMAL
  LINE SELECTOR : OFF

- WFM300 Component WFM
  MODE : BOWTIE
  VERTICAL GAIN : ×5
  HORIZONTAL MAG: OFF

- TSG 300
  3 WIRE MODE
  50% BOWTIE

- The length of cables marked with Ⓐ should be all the same.
  Ⓒ=Ⓑ+Ⓐ× 2

machine conditions for adjustment	specifications	adjustments
Step 1 • S1/EN-48P(A-3): ON • Play back a bowtie & 10T signal on alignment tape CR5-1B PS. • CAPSTAN LOCK sw: 2FD	VIDEO OUT 1/connector panel (WFM MODE/WAVEFORM VECTOR MONITOR)  Align the sync phase in CH-B with that in CH-A.	SYNC controls/ subcontrol panel (FINE: mechanical center) TRIG: TSG271 BLACK
Step 2	VIDEO OUT 1/connector panel (SCH MODE/WAVEFORM VECTOR MONITOR)  75 100 75 100 75 100 75 100 CH-A CH-B Align the sync phase in CH-B with that in CH-A.	SYNC (FINE) control/ subcontrol panel
Step 3 • VIDEO sw/subcontrol panel: MANUAL • After adjustment is completed, set S1 on the EN-48P(A-3) board to OFF and VIDEO switch to PRESET.	VIDEO OUT 1/connector panel (BOWTIE MODE/COMPONENT WFM) CH-1/CH-2 (Y/B-Y) CH-1/CH-3 (Y/R-Y)  Minimized the dip point Adjust the dip point to the center marker. Y/B-Y: 0 ± 10 nsec When the adjustment cannot be performed using RV15, the adjustment should be performed by moving the short to SL21, SL22 or SL23.	⊘RV15/VO-18P(C-4) VIDEO control/subcontrol panel TRIG: TSG271 BLACK

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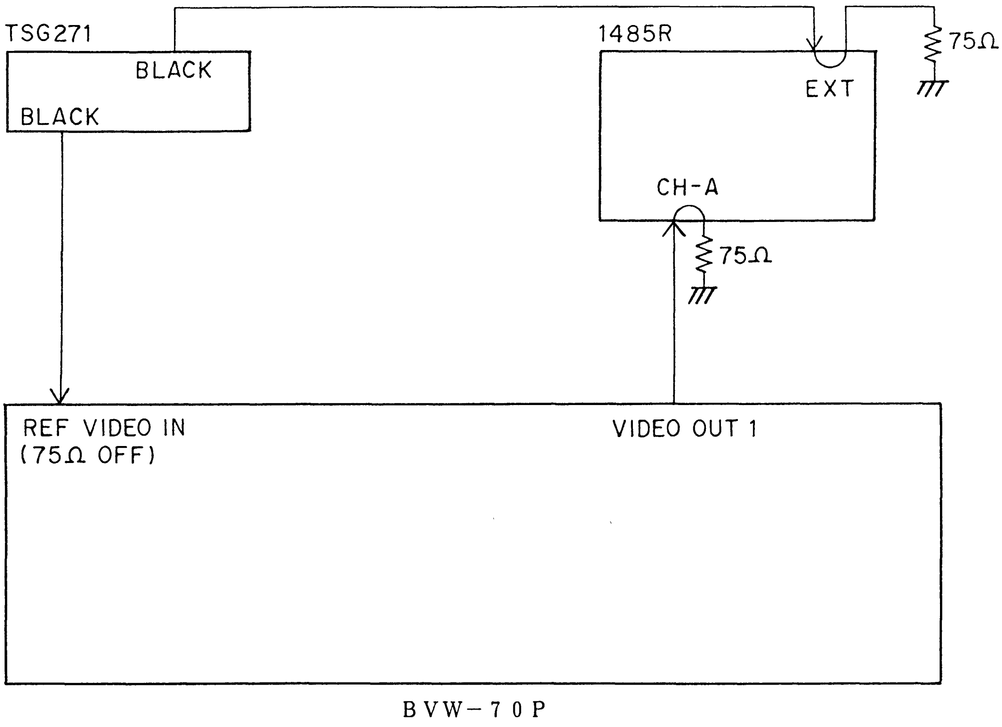
14-2-5. PB Composite Y/C Delay Adjustment

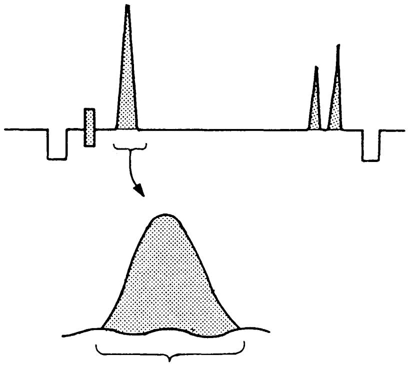
【Connection】



【Switch Setting】

- 1485R WFM

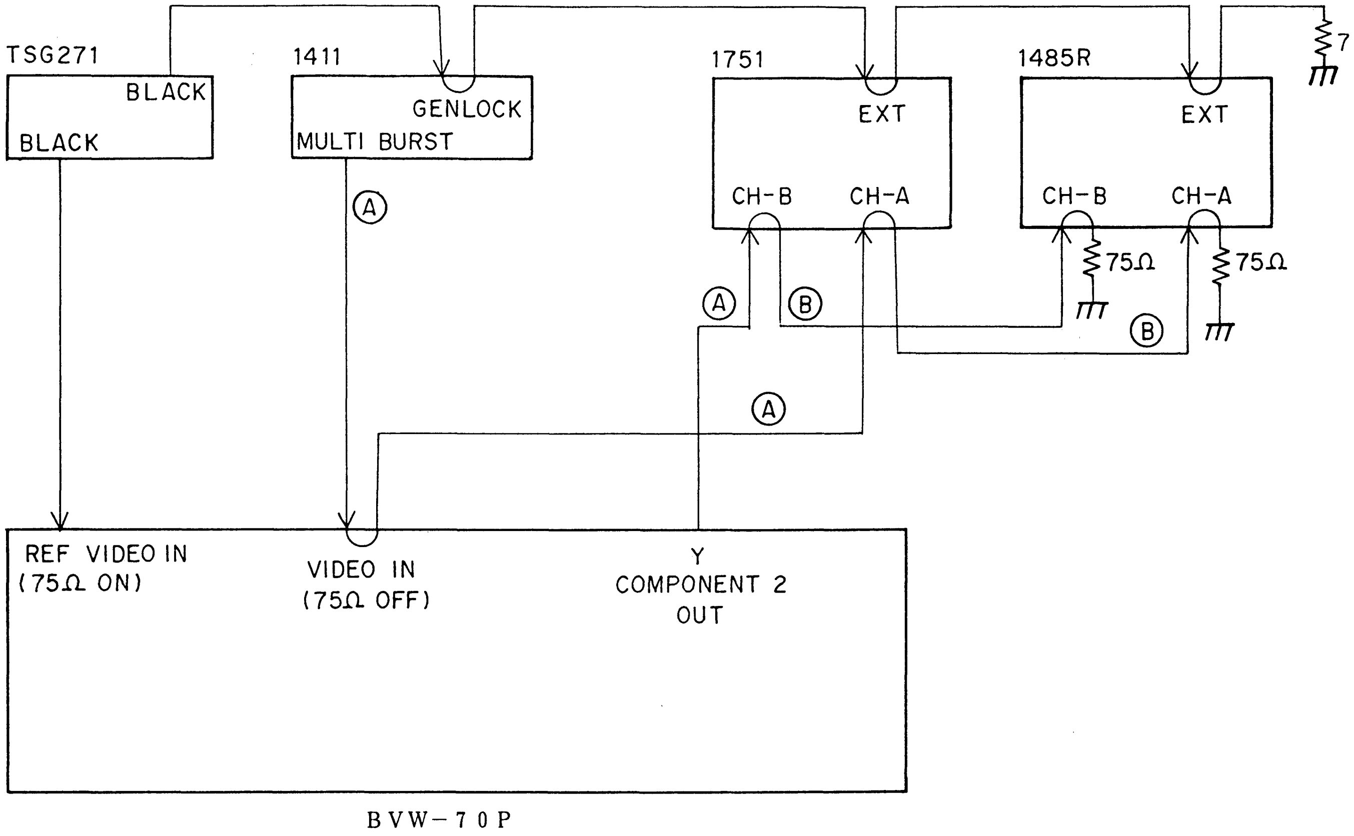
  SYNC : EXT
  LINE SELECT : 15 LINE
  FIELD : 1+3 ↔ 2+4

machine conditions for adjustment	specifications	adjustments
• Play back a bowtie & 10T signal on alignment tape CR5-1B PS. • CHROMA control/subcontrol panel: MANUAL • After adjustment is comlpeted, set CHROMA switch to PRESET.	VIDEO OUT 1/connector panel Adjust the LINE SELECT control of the waveform monitor so that the following waveform appears.  flat (0 ± 10nsec) When the specification is not satisfied, the adjustment should be performed shorting or opening SL350 and SL351. Check that the waveform is flat by pressing FIELD 1+3 and 2+4 on the waveform monitor alternately. If the waveform is not flat, set it to the be average of 1+3 and 2+4.	CHROMA control/ subcontrol panel ⊘RV350/EN-48P(B-2)

14－3. REC VIDEO PHASE ADJUSTMENT

14－3－1. REC Component Video Phase Adjustment

【Connection】


TSG271
BLACK
BLACK
1411
GENLOCK
MULTI BURST
1751
EXT
CH-B
CH-A
1485R
EXT
CH-B
CH-A
75Ω
75Ω
7
Ⓐ
Ⓐ
Ⓑ
Ⓑ
Ⓐ
REF VIDEO IN
(75Ω ON)
VIDEO IN
(75Ω OFF)
Y
COMPONENT 2
OUT
BVW－70P

The length of the cables marked with Ⓐ should be all the same.
The length of the cables marked with Ⓑ should be all the same.

【Switch setting】

- 1751 Waveform vector monitor

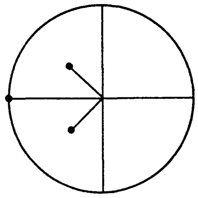
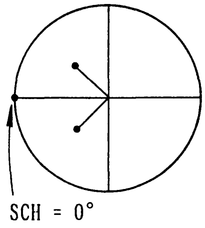
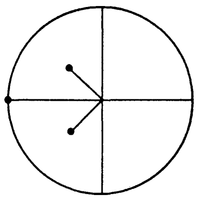
MODE	: WFM ↔ SCH
INPUT	: A ↔ B

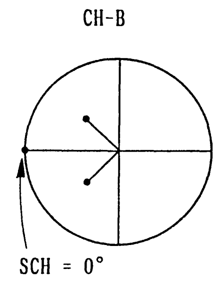
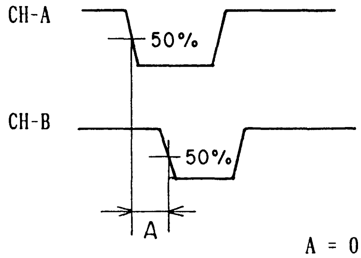
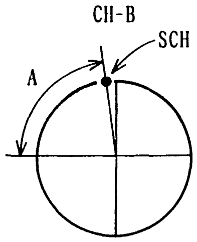
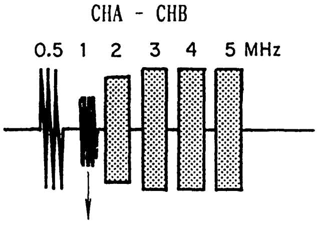
- 1485R WFM

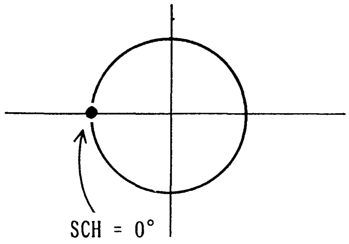
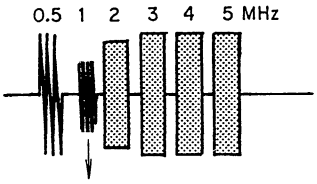
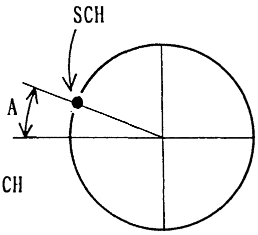
RESPONSE	: FLAT
INPUT	: A - B
VOLTS FULL SCALE	: 0.5
MAG	: 10 μsec
DISPLAY	: 10 μsec
LINE SELECTOR	: OFF
SYNC	: EXT

1411:

SYNCHRONIZATION····GENLOCK
HORIZONTAL LOCK····SYNC

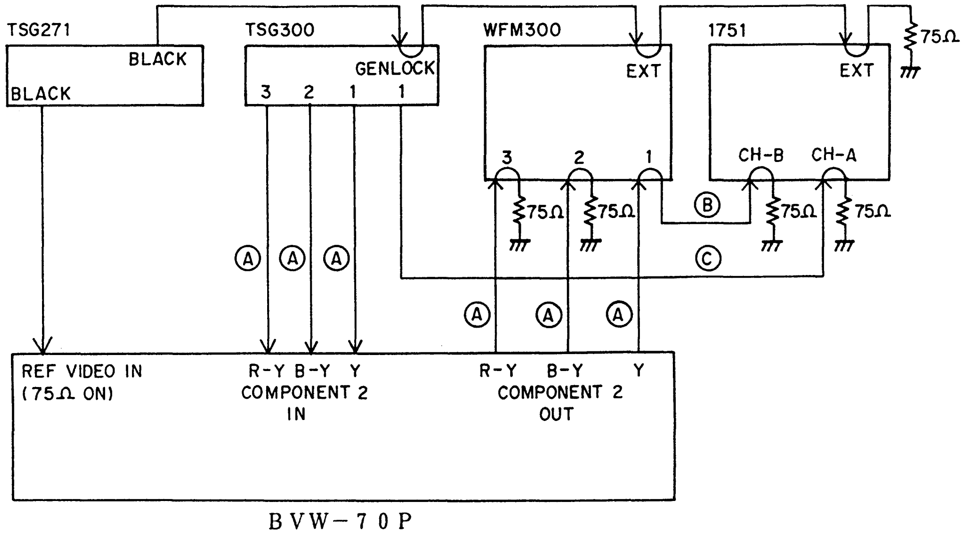
machine conditions for adjustment	specifications	adjustments
Step 1 • Supply a multi burst signal to the VIDEO IN connector. • INPUT SELECT sw: COMPOSITE • MODE: EE	VIDEO IN THROUGH OUT/connector panel (SCH MODE/WAVEFORM VECTOR MONITOR) CH-A  • Adjust the burst phase using the waveform vector monitor's PHASE control to scale marker.	PHASE control/waveform vector monitor
Step 2	VIDEO IN THROUGH OUT/connector panel (SCH MODE/WAVEFORM VECTOR MONITOR) CH-A 	SUBCARRIER control/1411 signal generater
Step 3	COMPONENT 2 Y OUT/connector panel (SCH MODE/WAVEFORM VECTOR MONITOR) CH-B  • Adjust the burst phase using the SC control to scale marker.	SC control/ subcontrol panel

Step 4	COMPONENT 2 Y OUT/connector panel (SCH MODE/WAVEFORM VECTOR MONITOR)  	SYNC (FINE) control/ subcontrol panel
Step 5	VIDEO IN THROUGH OUT/connector panel COMPONENT 2 Y OUT/connector panel (WFM MODE/WAVEFORM VECTOR MONITOR)  A = 0 Check the sync phase Check that the phase on CH-B coincides with that on CH-A when the CH-A and CH-B switches are pressed alternately. (CH-A REF)	
Step 6	COMPONENT 2 Y OUT/connector panel (SCH MODE/WAVEFORM VECTOR MONITOR)  A = 84 ± 5°	SYNC (FINE) control/ subcontrol panel
Step 7	COMPONENT 2 Y OUT/connector panel (WFM)  1.0 MHz: Minimize	⊘RV502/DEC-42P(E-5)

Step 8	COMPONENT 2 Y OUT/connector panel (SCH MODE/WAVEFORM VECTOR MONITOR) CH-B  	SYNC (FINE) control/ subcontrol panel
Step 9 • Supply a multi burst signal to the VIDEO IN connector. • INPUT SELECT sw: COMPOSITE • Insert the BCT-30M cassette tape. • MODE: REC/PB	COMPONENT 2 Y OUT/connector panel (WFM) CHA - CHB  1.0MHz: Minimize	SYNC (FINE) control/ subcontrol panel
Step 10 • MODE: REC/PB	COMPONENT 2 Y OUT/connector panel (SCH MODE/WAVEFORM VECTOR MONITOR) CH-B  Check the SCH A = 0 ± 0.5° If the specification is not satisfied, readjust according to Step 6 and repeat the above steps.	

14-3-2. REC Component Y/C, C/C Delay Adjustment

【Connection】


TSG271
BLACK
BLACK
TSG300
GENLOCK
3 2 1 1
WFM300
EXT
3 2 1
1751
EXT
CH-B CH-A
75Ω
75Ω
75Ω
75Ω
75Ω
Ⓐ Ⓐ Ⓐ
Ⓑ
Ⓒ
Ⓐ Ⓐ Ⓐ
REF VIDEO IN
(75Ω ON)
R-Y B-Y Y
COMPONENT 2
IN
R-Y B-Y Y
COMPONENT 2
OUT
BVW-70P

The length of the cables marked with Ⓐ should be all the same.
Ⓒ=Ⓑ+Ⓐ× 2

【Switch Setting】

- 1751 Waveform vector monitor

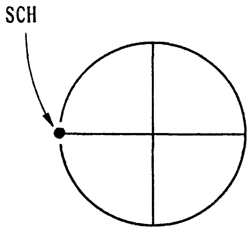
  MODE : WFM ↔ SCH
  INPUT : A ↔ B
  SWEEPS : 2H MAG
  DC RESET : OFF
  FILTERS : FLAT
  CAL : OFF
  EXT REF : ON
  FIELD SELECT : OFF
  GAIN : NORMAL
  LINE SELECTOR : OFF

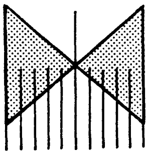
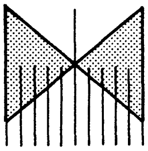
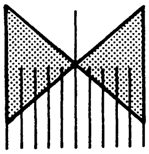
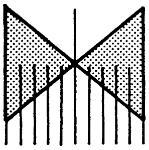
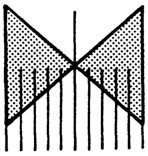
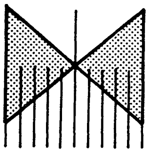
- WFM 300 Component WFM

  MODE : BOWTIE
  VERTICAL GAIN : × 5
  HORIZONTAL MAG :OFF

- TSG 300

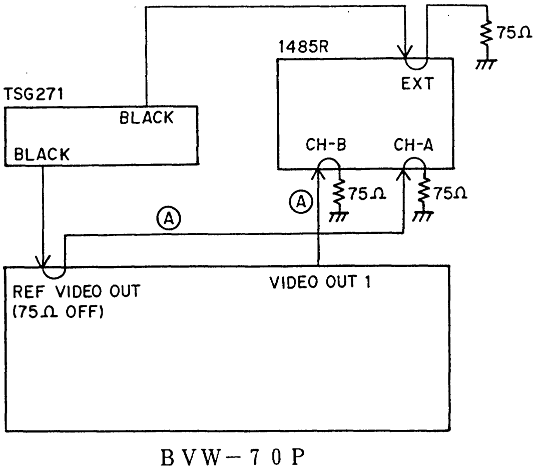
  3 WIRE MODE
  50% BOWTIE

machine conditions for adjustment	specifications	adjustments
Step 1 • INPUT SELECT sw: Y-R, B • Supply a 50% bowtie signal to the COMPONENT 2 IN connector. • MODE: EE • Insert the BCT-20M cassette tape.	COMPONENT 2 Y OUT/connector panel (SCH MODE/WAVEFORM VECTOR MONITOR)  Check that the phase on CH-B coincides with that on CH-A when the CH-A and CH-B switches are pressed alternately. (CH-A REF) Align the SCH in CH-B with that in CH-A.	SYNC (FINE) control/ subcontrol panel TRIG: TSG271 BLACK

Step 2 • CHROMA sw/subcontrol panel: MANUAL	COMPONENT 2 OUT/connector panel (BOWTIE MODE/COMPONENT WFM) CH-1/CH-2 (Y/B-Y)  CH-1/CH-3 (Y/R-Y)  Minimized the dip point. Adjust the dip point to the center marker. Y/R-Y: 0 ± 10 nsec	CHROMA control/ subcontrol panel ⊘RV504/DEC-42P(D-7)
Step 3	COMPONENT 2 OUT/connector panel (BOWTIE MODE/COMPONENT WFM) CH-1/CH-2 (Y/B-Y)  CH-1/CH-3 (Y/R-Y)  Adjust the dip point to the center marker. Y/B-Y: 0 ± 10 nsec	⊘RV200/DEC-42P(B-1)
Step 4 • INPUT SELECT sw: Y-R, B • Supply a 50% bowtie signal to the COMPONENT 2 IN connector. • MODE: REC/PB • After adjustment is completed, set CHROMA switch to PRESET.	COMPONENT 2 OUT/connector panel (BOWTIE MODE/COMPONENT WFM) CH-1/CH-2 (Y/B-Y)  CH-1/CH-3 (Y/R-Y)  • Check the dip point to the centor marker. Y/B-Y: 0 ± 20nsec Y/R-Y: 0 ± 20 nsec	

14-3-3. Burst Position Adjustment

【Connection】

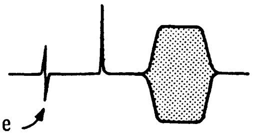
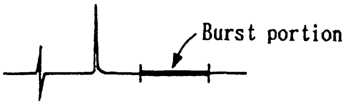
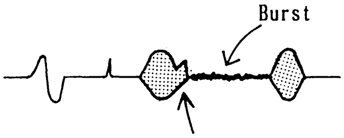
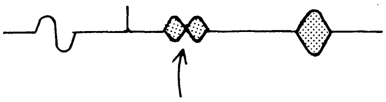
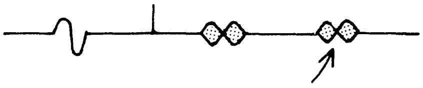

1485R
EXT
75Ω
TSG271
BLACK
BLACK
CH-B
CH-A
75Ω
75Ω
Ⓐ
Ⓐ
REF VIDEO OUT
(75Ω OFF)
VIDEO OUT 1
BVW-70P

【Switch setting】

1485R WFM

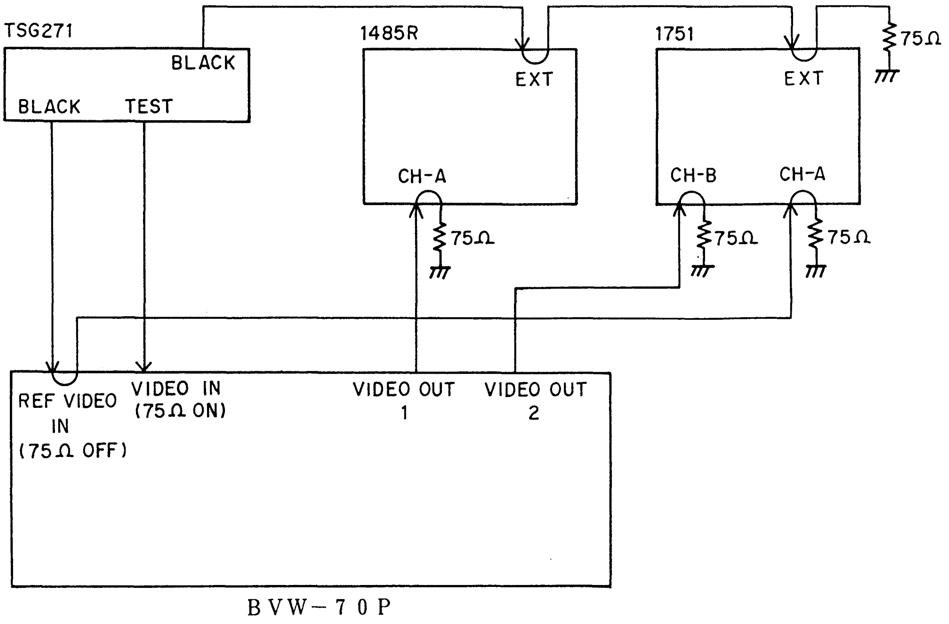
RESPONESE : FLAT
INPUT : A - B
VOLTS FULL SCALE : 0.2
MAG : 0.2
DISPLAY : 10 μsec
LINE SELECTOR : OFF
SYNC : EXT

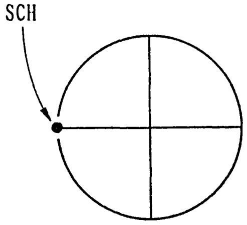
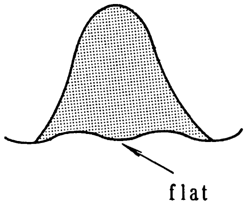
The length of the cables markee with Ⓐ should be all the same.

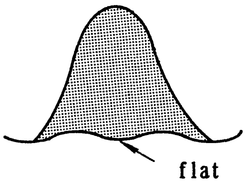
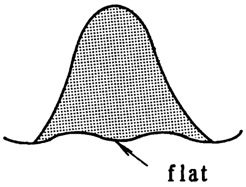
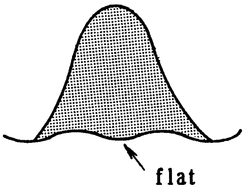
machine conditions for adjustment	specifications	adjustments
Step 1 • Supply a black burst signal to the REF. VIDEO IN connector. • MODE: EE	VIDEO OUT 1/connector panel (Terminated in 75 ohms.) (A-B MODE/WFM)  Minimize the falling edge of sync.	SYNC (FINE) control/ subcontrol panel
Step 2	 Burst portion Minimize the burst position.	SC control/subcontrol
Step 3	 Remove the distortion When the left portion in the burst signal is distorted, the adjustment should be performed. When it is not destorted, the adjustment may not be performed. When both the left and right waveforms are distorted, readjust Sec. 12-6-3.	⊘RV27/EN-48P(C-2)
Step 4	 Minimize	⊘RV12/EN-48P(C-2)
Step 5	 Minimize	⊘RV13/EN-48P(C-2)

14-3-4. REC Composite Y/C Delay Adjustment

【Connection】


TSG271
BLACK
BLACK
TEST
1485R
EXT
CH-A
75Ω
1751
EXT
CH-B
CH-A
75Ω
75Ω
75Ω
REF VIDEO IN (75Ω OFF)
VIDEO IN (75Ω ON)
VIDEO OUT 1
VIDEO OUT 2
BVW-70P

machine conditions for adjustment	specifications	adjustments
Step 1 • INPUT SELECT sw: COMPOSITE • Supply a pulse & bar signal to the VIDEO IN connector. • CHROMA sw/subcontrol panel: MANUAL • Insert the BCT-20M cassette tape. • MODE: EE	REF. VIDEO IN THROUGH OUT/connector panel VIDEO OUT 2/connector panel (SCH MODE/WAVEFORM VECTOR MONITOR)  Check that the phase on CH-B coincides with that on CH-A when the CH-A and CH-B switches are pressed alternately. (CH-A REF) Adjust the SCH in CH-B with that in CH-A.	SC control/subcontrol panel
Step 2 • CAPSTAN LOCK sw: Set the CAPSTAN LOCK switch to 2FD and 8FD repeatedly, and then to 2FD.	VIDEO OUT 1/connector panel (10T) 	⊘RV16/DEC-46P(E-2)

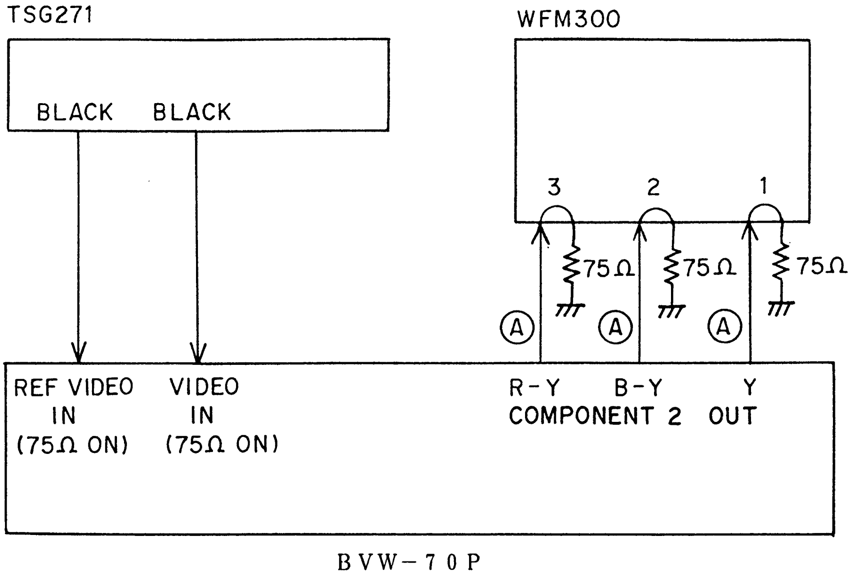
Step 3 • MODE: REC/PB • After adjustment is completed, put out the BCT-20M cassette tape.	VIDEO OUT 1/connector panel  0 ± 20 nsec • If the specification is not satisfied, readjust according to Step 2 and repeat the above steps.	
Step 4 • Insert the BCT-20G cassette tape. • MODE: EE	VIDEO OUT 1/connector panel  0 ± 20 nsec	CHROMA control/subcontrol panel ⊘CV1/DUS-288/DEC-46P(D-2)
Step 5 • MODE: REC/PB • After adjustment is completed, set CHROMA switch to PRESET.	VIDEO OUT 1/connector panel  0 ± 20 nsec • If the specification is not satisfied, readjust according to Step 4 and repeat the above steps.	

14-4. PB COLOR FRAMING ADJUSTMENT

14-4-1. ID Mix Pulse Adjustment

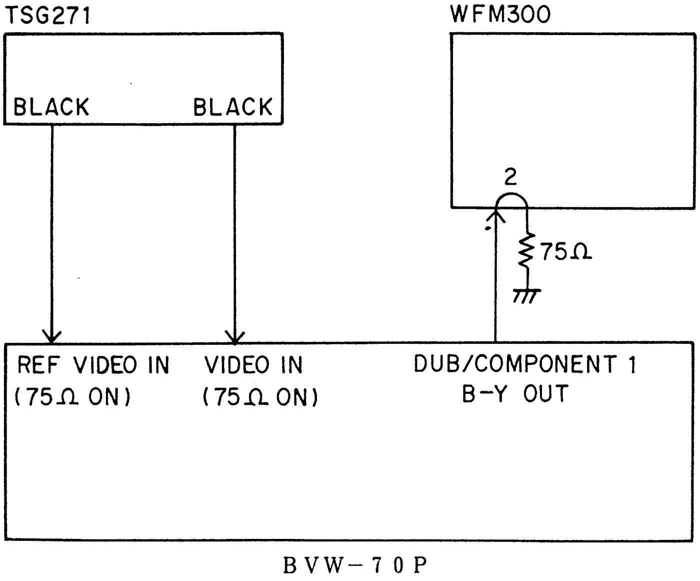
【Connection】

Fig 1


TSG271
BLACK
BLACK
WFM300
3
2
1
75Ω
75Ω
75Ω
Ⓐ
Ⓐ
Ⓐ
REF VIDEO IN (75Ω ON)
VIDEO IN (75Ω ON)
R-Y
B-Y
Y
COMPONENT 2 OUT
BVW-70P

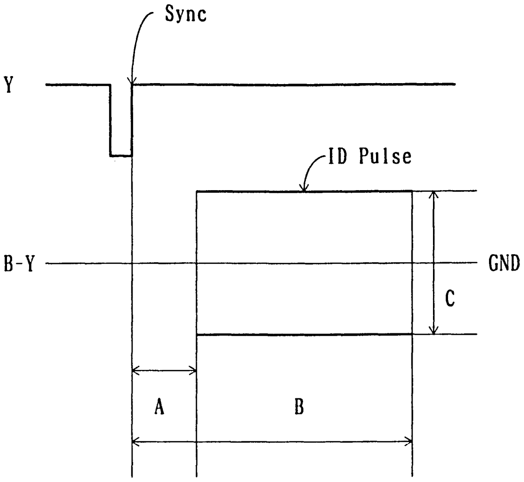
The length of cables marked with Ⓐ should be all the same.

Fig 2


TSG271
BLACK
BLACK
WFM300
2
75Ω
REF VIDEO IN (75Ω ON)
VIDEO IN (75Ω ON)
DUB/COMPONENT 1
B-Y OUT
BVW-70P

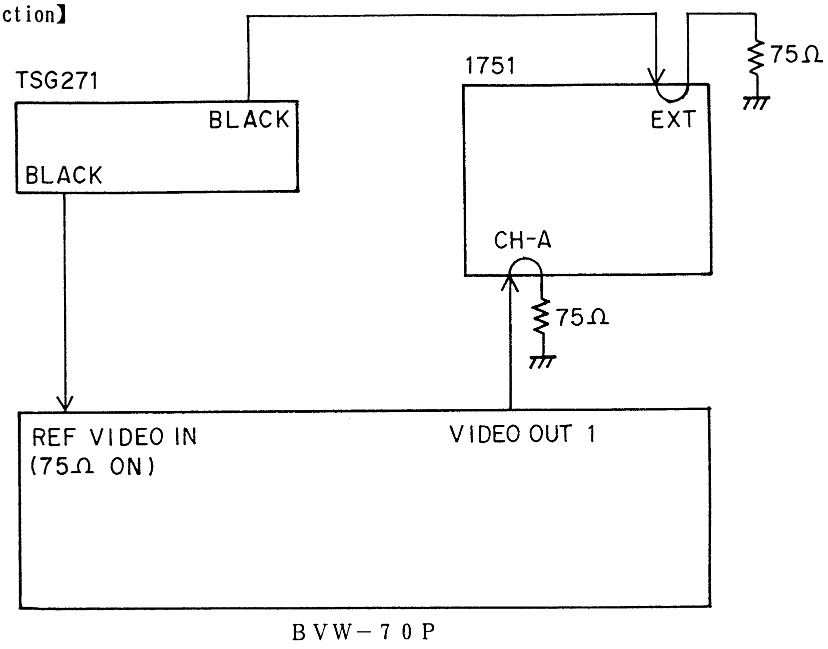
【Switch setting】

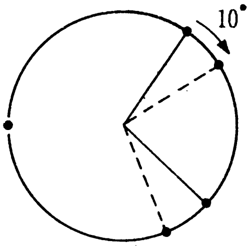
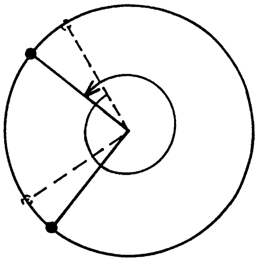
- WFM 300 component WFM
  MODE : WFM RERERENSE INT

machine conditions for adjustment	specifications	adjustments
Step 1 • INPUT SELECT sw: COMPOSITE • Supply a black burst signal to the VIDEO IN connector. • CAPSTAN LOCK sw: 8FD • S2/EN-48P(A-2): ON • CONNECTION: Fig 1	COMPONENT 2 Y OUT/connector panel COMPONENT 2 B-Y OUT/connector panel (WFM MODE/COMPONENT WFM)  A = 8 ± 1 μsec B = 55 ± 1 μsec C = 0.525 ± 0.02 Vp-p	• For A ⊘RV25/EN-48P(D-2) • For B ⊘RV26/EN-48P(D-2) • For C ⊘RV35/EN-48P(F-5) TRIG: INT
Step 2 • CONNECTION: Fig 2 • After adjustment is completed, Set S2 on the EN-48P(A-2) board to OFF. • After adjustment is completed, set CAPSTAN LOCK switch to 2FD.	DUB/COMPONENT 1 B-Y OUT/connector panel C = 0.525 ± 0.02 Vp-p	⊘RV36/EN-48P(E-5)

14-4-2. SC Phase Adjustment

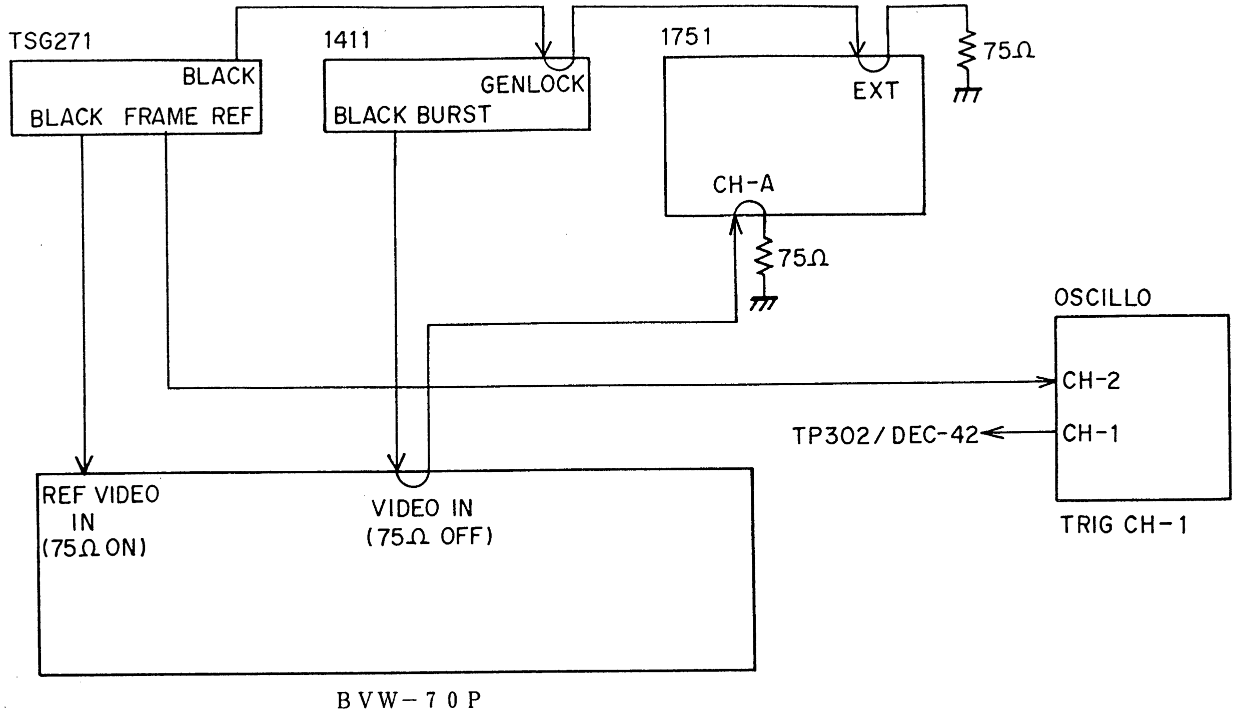
【Connection】

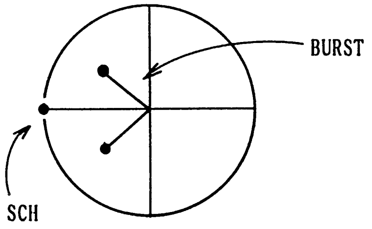


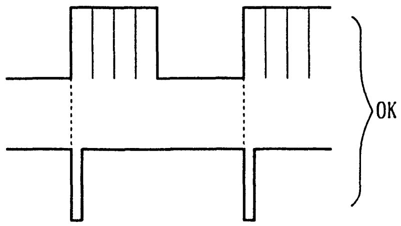
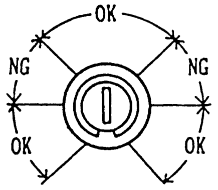
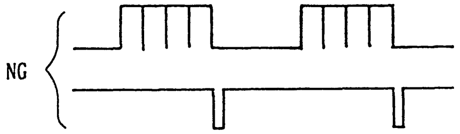
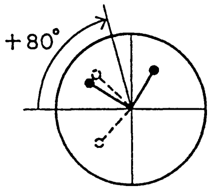
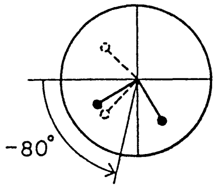
machine conditions for adjustment	specifications	adjustments
Step 1 • INPUT SELECT sw: COMPOSITE • Supply a black burst signal to the REF. VIDEO IN connector. • Set the burst phase on the circumference in GAIN ×5 and UNCAL modes. • Fully turn the SC control on the subcontrol panel and RV17 on the EN-48P board counterclockwise. • Using RV17 on the EN-48P board, preset to the position in which the burst is locked. • MODE: EE	VIDEO OUT 1 connector (Terminated in 75 ohms.) (SCH MODE/WAVEFORM VECTOR MONITOR)  Preset position in which the burst is locked. Delay the burst by 10 degrees using RV17 on the EN-48P board by turning it clockwise.	⊘RV17/EN-48P(D-1) TRIG: TSG271 BLACK
Step 2 • Turn the SC control to measure the SC phase variable range.	The control change should be 360° or more. 	SC control/subcontrol panel TRIG: TSG271 BLACK

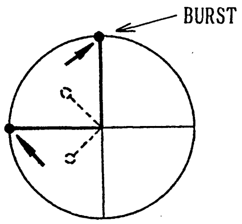
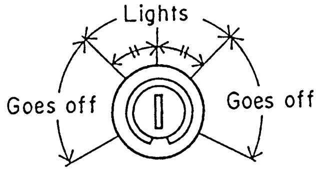
14-4-3. Decoder Field Pulse Adjustment

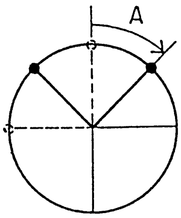
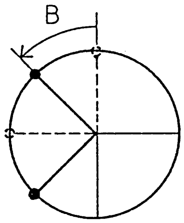
【Connection】


TSG271
BLACK
BLACK FRAME REF
1411
GENLOCK
BLACK BURST
1751
EXT
75Ω
CH-A
75Ω
OSCILLO
CH-2
TP302/DEC-42
CH-1
TRIG CH-1
REF VIDEO IN (75Ω ON)
VIDEO IN (75Ω OFF)
BVW-70P

machine conditions for adjustment	specifications	adjustments
Step 1 • INPUT SELECT sw: COMPOSITE • CAPSTAN LOCK sw: 2FD • Supply a black burst signal to the VIDEO IN connector.	VIDEO IN THROUGH OUT/connector panel (Terminated in 75 ohms.) (SCH MODE/WAVEFORM VECTOR MONITOR)  SCH = 0° • Adjust so that the burst phase coincides with the vector marker.	• BURST PHASE control/waveform vector monitor • SCH SUBCARRIER control/1411 signal generator

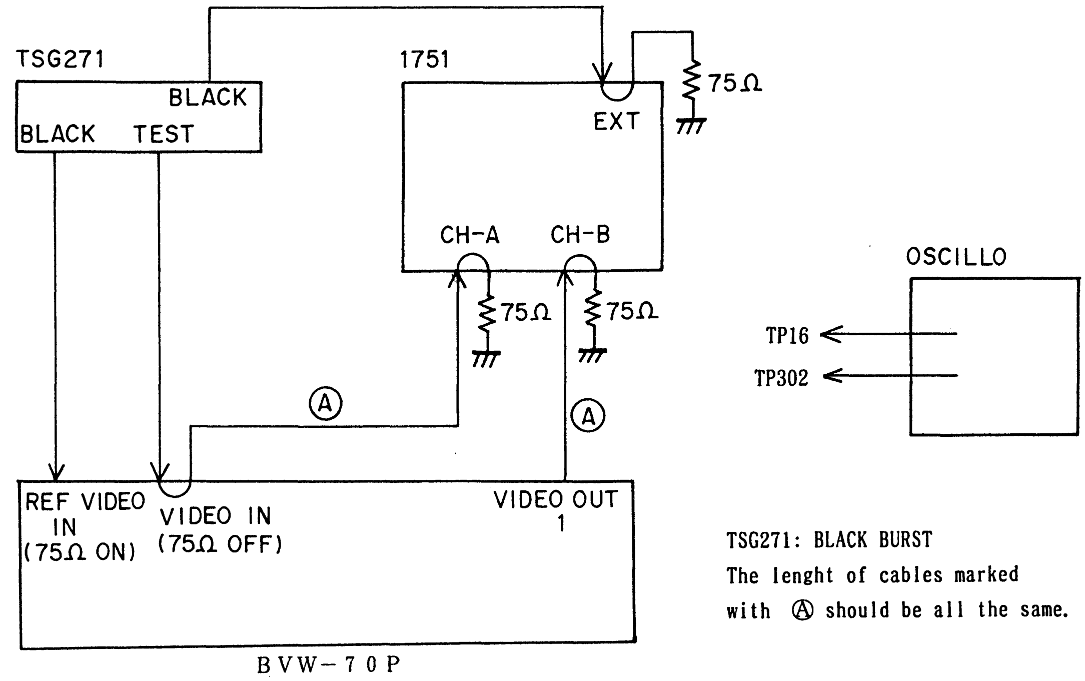
Step 2	TP302/DEC42P(F-3)  • Adjust so that a FRAME REF. pulse signal outputs at the leading edge of TP302.  At this time, the waveform is OK when RV506 is set to be with in the three ranges shown in the figure below. However, align RV506 to be in the middle of the OK range which is closest to mechanical center.  	⊘RV506/CF-36P on the DEC-42P board.
Step 3 • After adjustment is completed, set the burst phase using the signal generator's SUBCARRIER control to 0°.	VIDEO IN THROUGH OUT/connector panel (SCH MODE/WAVEFORM VECTOR MONITOR)  Be sure that the waveform should be OK when the burst phase is set at +80 degrees.  Be sure that the waveform should be OK when the burst phase is set at -80 degrees. • If the specification is not satisfied, adjusted to RV506 and repeat the above steps.	SUBCARRIER control/ 1411 signal generator

Step 4	VIDEO IN THROUGH OUT/connector panel (VECT MODE/WAVEFORM VECTOR MONITOR)  [GAIN: ×5]	GAIN uncal control/ waveform vector monitor PHASE control/ waveform vector monitor
Step 5	Turn the SCH IN lamp on the front panel on. Set RV507 to the center of the range in which the lamp lights.  	⊘RV507/CF-36P on the DEC-42P board.

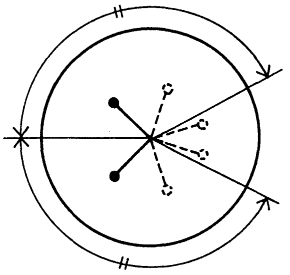
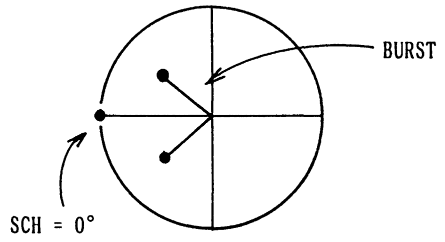
Step 6	VIDEO IN THROUGH OUT/connector panel (VECT MODE/WAVEFORM VECTOR MONITOR)  [GAIN: ×5] A is the angle of the burst when the SUBCARRIER control is stopped just before the SCH IN lamp goes out after having lit while rotating the burst phase to the right. A = 40 ± 10°  [GAIN: ×5] B is the angle of the burst when the SUBCARRIER control is stopped just before the SCH in lamp goes out after having lit while rotating the burst phase to the left. B = -40 ± 10° If the specification is not satisfied, adjusted to RV507 and repeat the above steps.	SUBCARRIER control/ 1411 signal generator

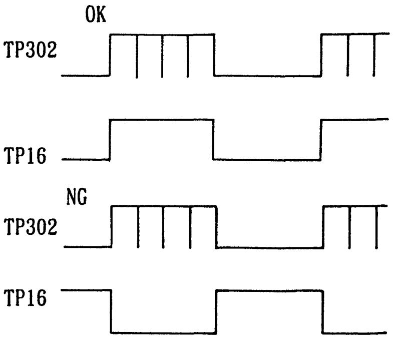
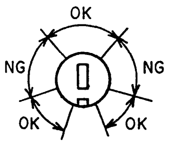
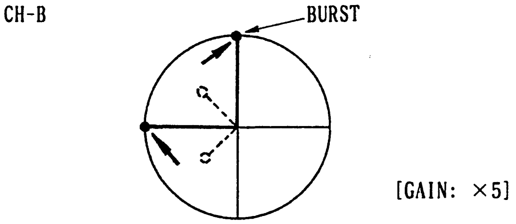
14-4-4. Encoder Field Pulse Adjustment

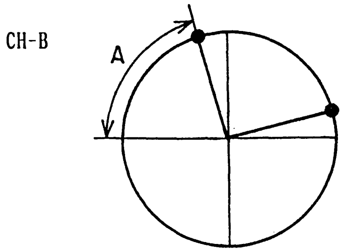
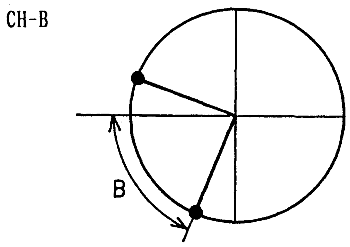
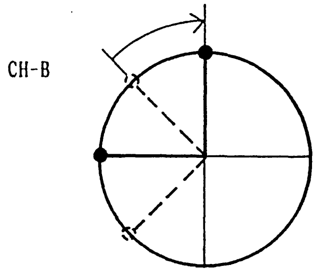
【Connection】


TSG271
BLACK
BLACK
TEST
1751
EXT
75Ω
CH-A
CH-B
75Ω
75Ω
Ⓐ
Ⓐ
OSCILLO
TP16
TP302
REF VIDEO IN (75Ω ON)
VIDEO IN (75Ω OFF)
VIDEO OUT 1
BVW-70P

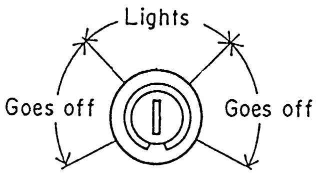
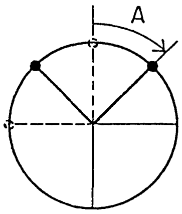
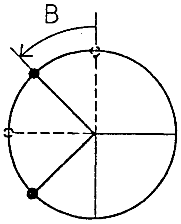
TSG271: BLACK BURST
The lenght of cables marked
with Ⓐ should be all the same.

machine conditions for adjustment	specifications	adjustments
Step 1 • Supply a black burst signal to the VIDEO IN connector. • INPUT SELECT sw: COMPOSITE • CAPSTAN LOCK sw: 2FD • MODE: EE	VIDEO OUT 1/connector panel (SCH MODE/WAVEFORM VECTOR MONITOR) CH-B  Adjust so that the burst phase is set to the center of the range when the SC control is turnd clockwise and counterclockwise.	SC control/ subcontrol panel TRIG: TSG271 BLACK
Step 2	VIDEO OUT 1/connector panel (SCH MODE/WAVEFORM VECTOR MONITOR) CH-B  Adjust so that the burst phase coincides with the vector marker.	PHASE control/waveform vector monitor SYNC control/ subcontrol panel

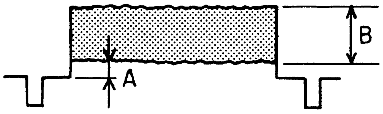
Step 3	TP302/DEC-42P(F-3) TP16/EN48P(A-2)  OK TP302 TP16 NG TP302 TP16 Adjust so that the waveform is OK.  OK NG NG OK OK At this time, the waveform is OK when RV19 is set to be with in the three ranges shown in the figure below. However, align RV19 to be in the middle of the OK range which is closest to mechanical center.	⊘RV19/EN-48P(C-2) TRIG: TP302/DEC-42P(F-3)
Step 4	VIDEO OUT 1/connector panel (VECT MODE/WAVEFORM VECTOR MONITOR)  CH-B BURST [GAIN: ×5]	PHASE control/waveform vector monitor GAIN uncal control/ waveform vector monitor

Step 5 • After adjustment is completed, set SC control to mechanical center.	VIDEO OUT 1/connector panel (VECT MODE/WAVEFORM VECTOR MONITOR)  A is the angle of the burst when the waveform on the oscilloscope is just abuut to change from OK to NG while rotating the burst phase clockwise.  B is the angle of the burst when the waveform on the oscilloscope is just abuut to change from OK to NG while rotating the burst phase counterclockwise. A = B ± 5° When the specification is not satisfied, adjust RV19 finely and readjust the above steps.	SC control/subcontrol panel
Step 6	VIDEO OUT 1/connector panel (VECT MODE/WAVEFORM VECTOR MONITOR)  [GAIN: ×5]	PHASE control/waveform vector monitor

http://getMANUAL.com

Step 7	Turn the SCH OUT lamp on the front panel on. Set RV20 to the center of the range in which the lamp lights. 	⊘RV20/EN-48P(C-2)
Step 8	VIDEO OUT 1/connector panel (VECT MODE/WAVEFORM VECTOR MONITOR) CH-B  [GAIN: ×5] A is the angle of the burst when the SC control is stopped just before the SCH OUT lamp goes out after having lit while totating the burst phase to the right. A = 40 ± 10° CH-B  [GAIN: ×5] B is the angle of the burst when the SC control is stopped just before the SCH OUT lamp goes out after having lit while rotating the burst phase to the left. B = -40 ± 10° When the specification is not satisfied, adjust RV20 finely and readjust the above steps.	SC control/subcontrol panel

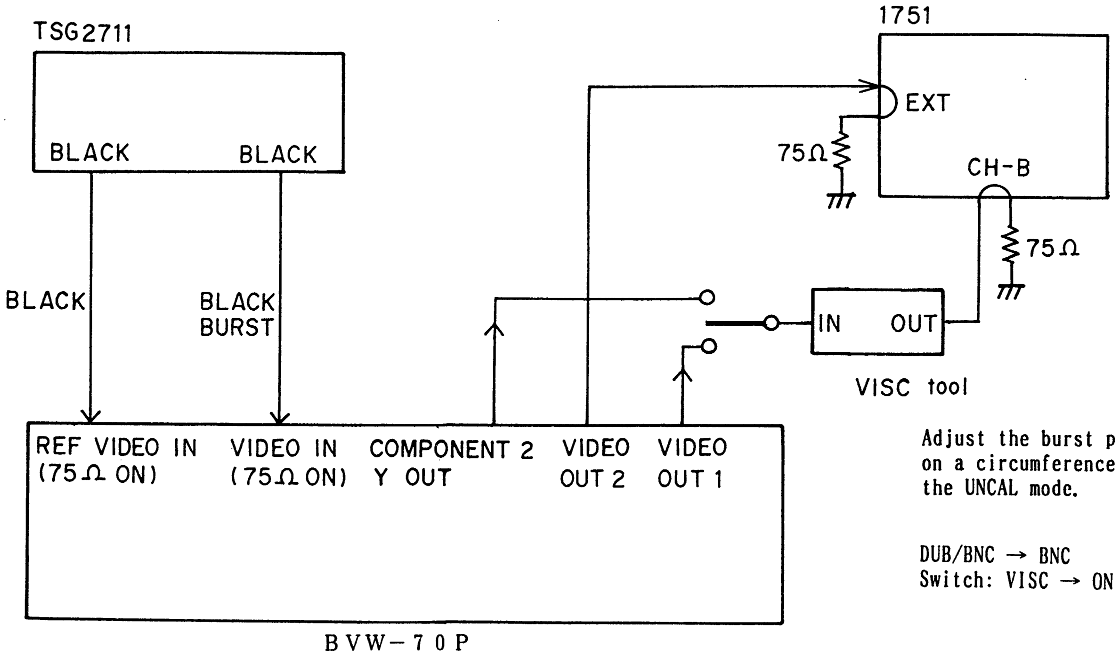
14-4-5. REGEN. VISC Level Adjustment

machine conditions for adjustment	specifications	adjustments
• INPUT SELECT sw: COMPOSITE • Supply a black burst signal to the REF. VIDEO IN and VIDEO IN connector. • CAPSTAN LOCK sw: 8FD • S500-Bit 4/TBC-12P: ON • S4-Bit 8/TBC-9P: ON	DUB/COMPONENT 1 OUT, pin 1 (Terminated in 75 ohms.) (WFM MODE/WAVEFORM VECTOR MONITOR) (LINE SELECTOR: LINE 8)  A (SETUP level) = 200 ± 5 mVp-p B (VISC level) = 300 ± 5 mVp-p	• SETUP level ⊘RV701/VO-18P(A-3) • VISC level ⊘RV700/VO-18P(A-3)
• After adjustment is completed, return the above switches to the former position.	COMPONENT 2 Y OUT (Terminated in 75 ohms.) A (SETUP level) = 200 ± 5 mVp-p B (VISC level) = 300 ± 5 mVp-p	• SETUP level ⊘RV704/VO-18P(B-3) • VISC level ⊘RV703/VO-18P(A-3) TRIG: INT

14-5. VISC ADJUSTMENT

[Connection]

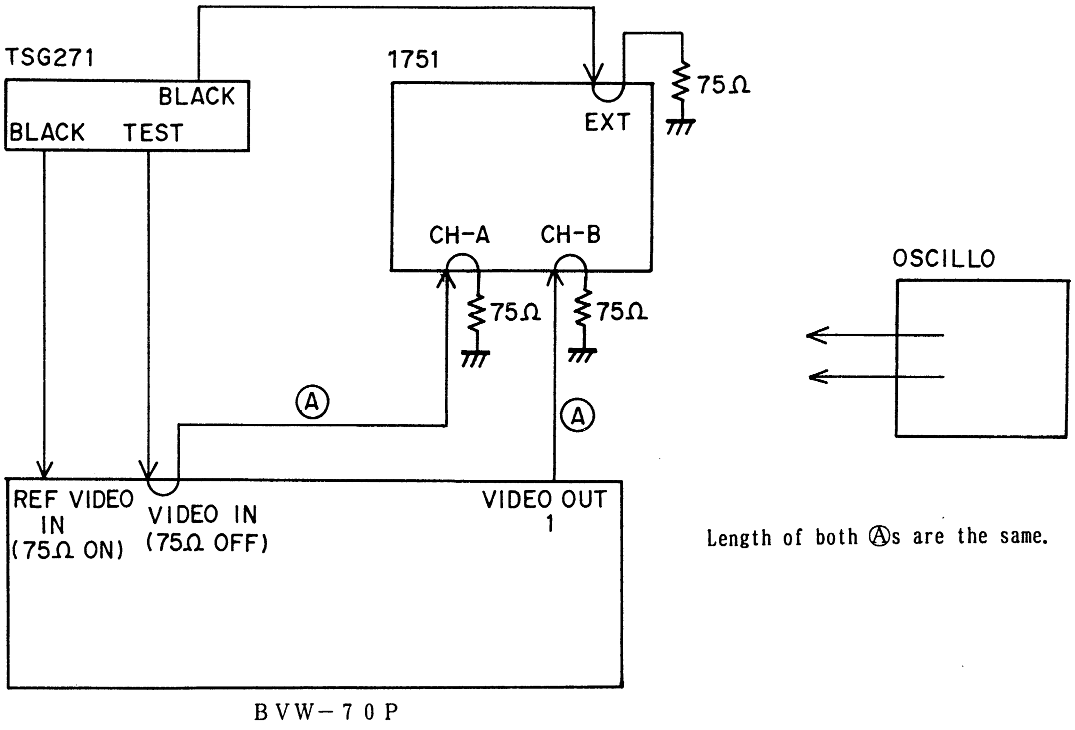
Fig 1


TSG2711
BLACK
BLACK
BLACK
BLACK
BURST
1751
EXT
75Ω
CH-B
75Ω
IN
OUT
VISC tool
REF VIDEO IN
(75Ω ON)
VIDEO IN
(75Ω ON)
COMPONENT 2
Y OUT
VIDEO
OUT 2
VIDEO
OUT 1
BVW-70P

Adjust the burst phase on a circumference in the UNCAL mode.

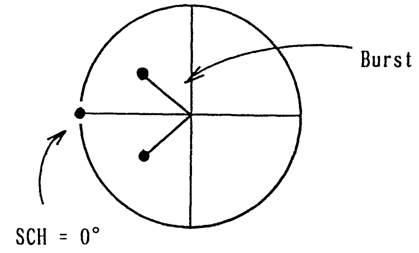
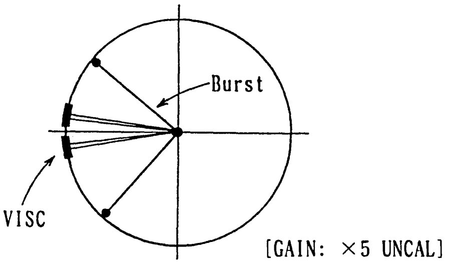
DUB/BNC → BNC
Switch: VISC → ON

Fig 2

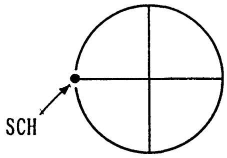
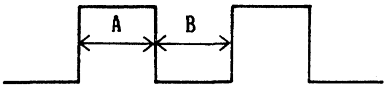

TSG271
BLACK
BLACK
TEST
1751
EXT
75Ω
CH-A
CH-B
75Ω
75Ω
Ⓐ
Ⓐ
OSCILLO
REF VIDEO
IN
(75Ω ON)
VIDEO IN
(75Ω OFF)
VIDEO OUT
1
BVW-70P

Length of both Ⓐs are the same.

14-5-1. Decoder VISC Phase Adjustment

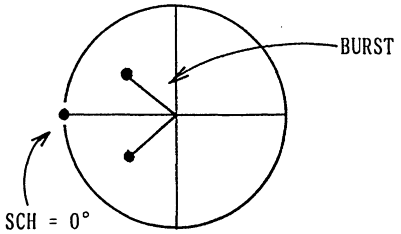
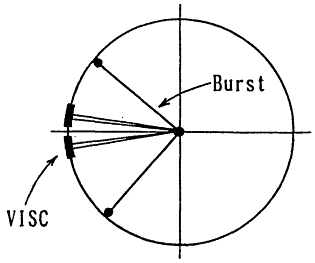
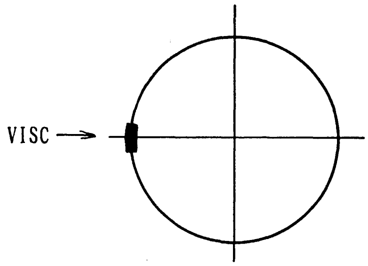
machine conditions for adjustment	specifications	adjustments
Step 1 • Supply a black burst signal to the VIDEO IN connector. • CONNECTION: Fig 1 • INPUT SELECT sw: COMPOSITE • MODE: EE • CAPSTAN LOCK sw: 2FD • S500-Bit 4/TBC-12P: ON • S3-Bit 1 to S3-Bit8/TBC-9P: OFF • S4-Bit 1 to S4-Bit7/TBC-9P: OFF • S4-Bit 8/TBC-9P: ON	VIDEO OUT 1 through VISC tool (SCH MODE/WAVEFORM VECTOR MONITOR)  Adjust so that the burst phase coincides with the vector marker.	• BURST PHASE control/waveform vector monitor • SCH SC control/subcontrol panel
Step 2 • After adjustment is completed, return the above switches to the former position.	VIDEO OUT 1 through VISC tool (VECT MODE/WAVEFORM VECTOR MONITOR) [LINE SELECTOR: LINE 8]  Set the VISC phase to 0 degrees. (Jitter center) When the specification is not satisfied, move the short to SL3, SL4, SL5, SL6 or SL7.	⊘RV510/CF-36P on the DEC-42P(E-7). TRIG: VIDEO OUT 2/ connector panel

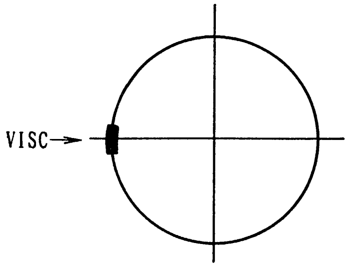
14-5-2. VISC Duty Adjustment

machine conditions for adjustment	specifications	adjustments
Step 1 • Supply a black burst signal to the VIDEO IN connector. • INPUT SELECT sw: COMPOSITE • CAPSTAN LOCK sw/subcontrol panel: 8FD • MODE: EE • CONNECTION: Fig 2	VIDEO OUT 1/connector panel (SCH MODE/WAVEFORM VVECTOR MONITOR)  Check that the phase on CH-B coincides with that on CH-A when the CH-A and CH-B switches are pressed alternately. (CH-A REF) Adjust so that the SCH phase on CH-B coincides with that on CH-A.	SYNC(FINE)control/ subcontrol panel
Step 2 • After adjustment is completed, set CAPSTAN LOCK switch to 2FD.	TP701/EN-48P(F-2)  A = B ± 2 %	⊘RV703/EN-48P(G-1) TRIG: INT

14-5-3. VISC Phase Adjustment

Input/output SCH should be 0°.

machine conditions for adjustment	specifications	adjustments
Step 1 • Supply a black burst signal to the VIDEO IN and the REF. VIDEO IN connectors. • CAPSTAN LOCK sw: 8FD • INPUT SELECT sw: COMPOSITE • S3-Bit 1 to Bit 8/TBC-9P: OFF • S4-Bit 1 to S4-Bit 7/TBC-9P: OFF • S500-Bit 4/TBC-12P: ON • S4-Bit 8/TBC-9P: ON • CONNECTION: Fig 1 S4/VO-18P: OFF	VIDEO OUT 1 through VISC tool (SCH MODE/WAVEFORM VECTOR MONITOR)  Adjust so that the burst phase cointides with the vector marker.	• BURST PHASE control/waveform vector monitor • SCH SC conterol/subcontrol panel
Step 2	VIDEO OUT 1 through VISC tool (VECT MODE/WAVEFORM VECTOR MONITOR) [LINE SELECTOR: LINE 8]  [GAIN: ×5 UNCAL] Set the VISC phase to 0 degress (jitter center) Note: When the specification is not satisfied, move the short to R138, R140, R142 and R144.	⊘RV701/EN-48P(G-1) TRIG: VIDEO OUT 2/ connector panel
Step 3	COMPONENT 2 Y OUT through VISC tool (VECT MODE/WAVEFORM VECTOR MONITOR) [LINE SELECTOR: LINE 8]  Set the VISC to 0°. (jitter center)	PHASE control/waveform vector monitor TRIG: VIDEO OUT 2/ connector panel

Step 4 • S4/VO-18P: ON • After adjustment is completed, return the above switches to the former position.	COMPONENT 2 Y OUT through VISC tool (VECT MODE/WAVEFORM VECTOR MONITOR) [LINE SELECTOR: LINE 8]  Set the VISC to 0°. When the specification is not satisfied, move the short to R139, R141, R143, R145.	⊘RV702/EN-48P(G-1) TRIG: VIDEO OUT 2/ connector panel

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SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer :

Check the metal trim, “metallized” knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 3.5 mA. Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers’ instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The “limit” indication is 5.25 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 20 V AC range are suitable. (See Fig. A)

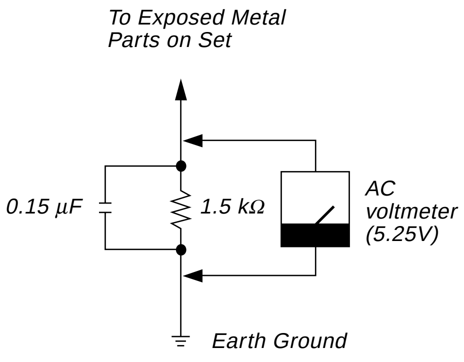

Fig A. Using an AC voltmeter to check AC leakage.

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